2010

Internet Applications and Web Development - Business Plan

Fanshawe College

Executive Summary - Proposed Internet Applications and Web Development Diploma Program

Program Description

The Internet Applications and Web Development Ontario College Diploma program prepares students to work in the growing field of web-centric business application development. The focus of the program is on the construction of various types of web applications using leading web environments, tools, servers, databases and languages. In addition, students will learn the fundamentals of both business and technology. They will develop an understanding of basic hardware, networking and operating systems as well as the installation and configuration of web and e-mail servers in Windows and Linux. Training will include the installation and development of corporate web-enabled databases. Students will gain the knowledge required to build secure, reliable and useful web applications using industry standard photo, graphics, animation, database, page design and programming tools. Students will also learn and practice proper project management principles.

Graduates will typically find employment as entry-level web developers, web technicians, web masters, web programmers, web site developers, internet site developers, e-commerce web site developers, web administrators, Internet programmers or as members of an integrated web development team. They will be employed in computer software development firms, information technology consulting firms and in information technology units throughout the private and public sectors, and many may choose to become independent contractors.

Rationale

Based on an external focus group held in October of 2008, internal discussions around Web Development Essentials (recently renamed to Internet Applications and Web Development Fundamentals or WDF for short), and the more recent program review of the Business Information Systems or BIS for short, we have decided changes are required to our program mix.

WDF is a 3 semester certificate program with generally low numbers. The general feedback was that they program was too short and did not provide enough time for students to refine their skills. The employment statistics are not great and for many there only option is to try contract work. BIS, while being a longer program at 4 semesters in length, has suffered similar problems. The enrolment numbers are low and the employment rate is well below the Fanshawe College benchmark. Both of those programs, however, did serve a purpose and that was an exit point for those students who struggle in the Computer Programmer Analyst (CPA) program. BIS and WDE generally graduate more students than they bring in Level 1 because they acted as the safety net. In some ways that became part of the downfall; they were attracting some of the weaker students from CPA and not drawing their own sustainable intake. The numbers drew attention to an underlying problem in the BIS program in particular and that is the program did not have a clear focus and career path. It was a little business with a little IT and programming, but not enough depth to be employable in the IT field. As we conducted the internal assessment and listened to the external focus groups in became clear that WDF was too short and not enough depth and BIS was not focused enough and also lacked depth.

The end result was the decision to suspend the intakes of BIS and WDF and create a new program that seeks to capitalize on a growth market in web development with a duration that allows for more in depth skills acquisition. The proposed new program is a two year Diploma called Internet Applications and Web

development. The program builds from the foundation of BIS and WDF while integrating some new courses and advanced skills from the CPA program. The result is a new program that shares all but one course in the first two levels with CPA. It also shares some courses with CPA in levels 3 and 4. Sharing courses, especially early on still maintains the transferability and ability to 'exit' as we have now and it also softens the financial impact of running a new program until it builds its own foundation.

The longer term plan is to then create an advanced diploma that would tack on a 3rd year and a co-op component to the proposed 2 year diploma. Currently the only true 'development' program is CPA and this new program will change that reality and allow us to market the program under its own merits. The preliminary focus groups identified co-op as being a key element of a new web program, but that same group also wanted the program to be 3 years in duration. Due to the proposed program being only 2 years, the co-op component would need to start after level 2 with a 4 month co-op and another one between levels 3 and 4 or the co-op would be 8 months between levels 3 and 4. Both approaches have a downside and previous IT programs have proven that co-op in 2 year programs. There are also many target markets that would prefer the ability to complete programs in as short of timeframe as possible and by not having co-op, they can complete the program in 20 months with a September start and 16 months with a January start. Co-op would extend the duration and it may impact our ability to draw the mature audience, especially those in the second career program. The School of IT has a very successful model of running a 2 year non co-op and a 3 year co-op where the programs share the same curriculum in the first 2 years. The long term vision is to run the Web Development programs in similar fashion allowing students the flexibility to choose the duration and whether or not they wish to take co-op. Instead of starting with both programs it was decided that the path of least risk is to start with the 2 year program to assess the market demand and employer demand prior to developing the 3 year program.

The advantage of this program is that students will gain skills in Windows and Linux based web server installation and configuration; build their programming skills in Java, ASP .NET, and PHP; build an application focused on e-commerce; acquire mobile development skills; and throughout the program develop communication, business and project management skills. This proposed program fits well with the feedback from the external focus group meeting back in the Fall of 2008.

Current Trends and Opportunities

In the top technology trends that will impact the skills required to gain employment in the ICT sector, the ICTC Outlook on Human Resources in the Information and Communications Technology Labour Market, 2008 to 2015: Summary Report lists Web 2.0 as one of those trends; "The trend toward using Web technology to run software applications that create and manipulate information significantly alters skills requirements and the demand for web designers, programmers and system designers."

Job Futures (National Edition)

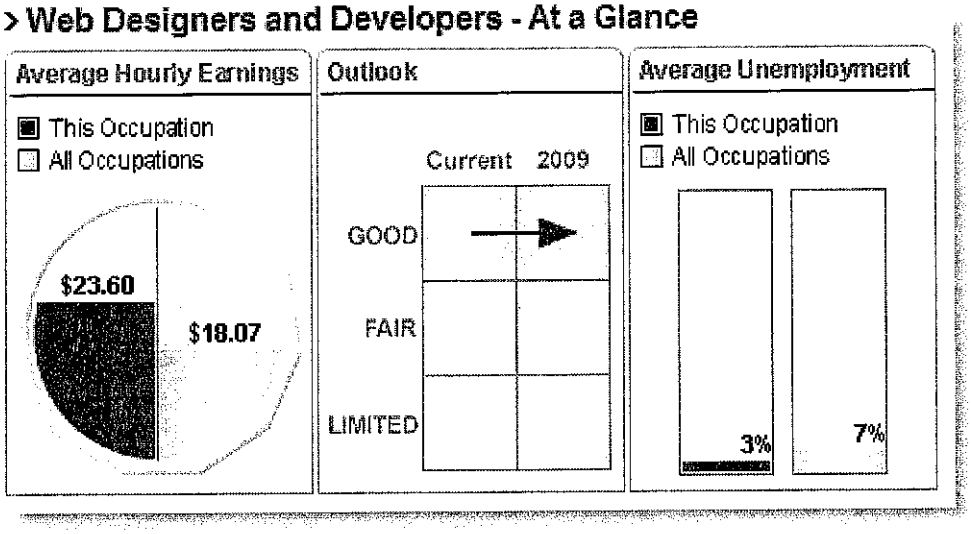


Figure 1. Job futures At a Glance (Source: http://www.jobfutures.ca)

> Web Designers and Developers

At Work | Education, Training, and Experience | **Work Prospects** | Important Facts

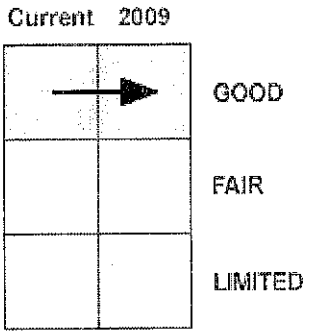
Current Conditions | Work Prospects | Outlook to 2009 | Preparing for the Competition

>Current Conditions

Your work prospects are rated GOOD because:

- >Employement grew at an average rate.
- >Hourly wages ($23.60) are above the average ($18.07), and the rate of wage growth is also above average.
- >The unemployment rate (3%) is close to the 2004 average (7%).

>Work Prospects



How the ratings are determined.

>Outlook To 2009

Your work prospects will continue to be GOOD because:

- >Enrolment in the fields of study related to this occupation has increased considerably. This will likely result in a very significant number of graduates over the next few years and could lead to a decrease in employment opportunities. The employment growth rate will likely be above average.
- >The retirement rate will likely be below average, and the number of retiring workers should not contribute significantly to job openings.
- >The number of job seekers will likely exceed the number of job openings.

Figure 2. Work Prospects (Source: http://www.jobfutures.ca)

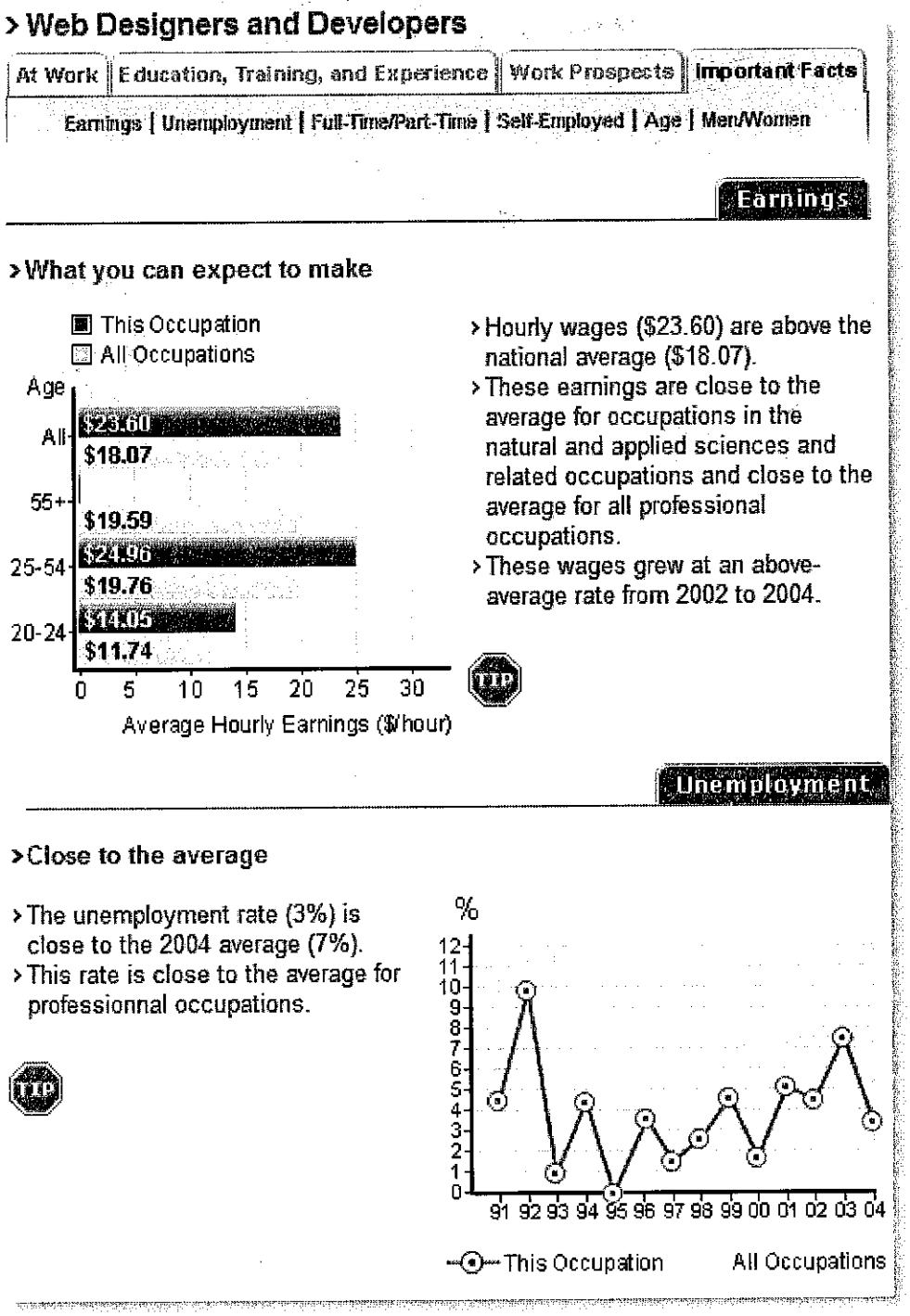


Figure 3. Wages and Unemployment Rate (Source: http://www.jobfutures.ca)

While the employment projections are inconsistent depending on the source, there is consensus that web technologies will continue to grow in how they are used by everyday business. Therefore, the proposed program is well positioned to prepare students for that reality. By building in skills in Java, ASP .Net, SQL/Databases and Mobile Development, graduates of this program will have skill sets that would allow

them to seek other development opportunities outside of the standard web developer and web designer roles. This will be a great competitive advantage for graduates of the proposed program.

Sample Job Opportunities

Web Developer
Autodata Solutions Company (London ON): "...**Web Developer** The Developer's role is to write, code, test, and analyze software programs and applications. This..."
www.autodatasolutions.com - Jobs - Map - 18 May 2010 - 04:38pm - 6.3 km - Cached - Similar - Tell Friend

Junior Web Developer
BDQWorks (Mississauga ON): "...**Web Developer** BDQWorks is looking for a junior PHP **Web Developer** to assist our **Web** Development team leader..."
www.bdqworks.com - Jobs - 03 May 2010 - 12:03pm - 83.1 km - Cached - Similar - Tell Friend

Web Developer
Strategic Information Technology Ltd. / SIT (Stouffville ON): "...**developing** database driven **web** applications, including in depth knowledge of Cascading Style Sheets, JavaScript, HTML, and **Web** Services. * Experience with..." Deadline: 31 Dec 2010
www.stratinfotech.com - Jobs - Map - 21 May 2010 - 11:13am - 135.1 km - Cached - Similar - Tell Friend

Web Site Developer
E-Crew Media Productions (Collingwood ON): "...**web site developer**. The ideal candidate is a person with a good knowledge of all the inner workings of the **Web**, and should..."
www.e-crew.ca - Jobs - 26 May 2010 - 05:08pm - 104.3 km - Cached - Similar - Tell Friend

Details

Print this Job | ShareThis

Company: Conversys Inc
Position Title: Intermediate Web/Flash Developer, Professional Services
Position Type: Full-time / Permanent
Location: London
Date Posted: Jun 3 2010

market advantage powered by conversys

Requirements

Experience: See description
Education: See description

Description

Conversys Inc (http://www.conversysinc.com/) is seeking energetic and creative individuals to join our Information Technology Professional Services Team. Reporting to the Professional Services Team Lead, you will:

- Design and develop applications using Adobe Flex Builder, Flash and ActionScript 3
- Perform all web development tasks required to deploy new customers
- Design and develop any customizations required for new and existing customer deployments
- Provide support for the live environment
- Utilize source control
- Effectively manage project development timelines and deadlines
- Create technical documentation where required
- Identify opportunities and recommend strategies to continuously improve development practices, delivery processes, and products
- Participate in code walk-throughs
- Assist our Product Development Team as required

Details

Print this Job | ShareThis

Company: Compass Group Canada
Position Title: Senior Developer - Team Lead (London, Ontario)
Position Type: See description
Location: London
Date Posted: Apr 29 2010

Requirements

Experience: See description
Education: See description

Description

Compass Group Canada is the nation's leading food service and facilities management company. With over 18,000 associates and annual managed revenues of $1.2 billion, we set the standard for food and service excellence.

Our vision for growth and success is a powerful one - to combine fresh ideas with the industry's greatest talent -- ***Great People, Great Service, Great Results!*** Because we 'live' our values, Compass Group Canada was selected as one of the Top 100 Employers of Canada in 2009 and 2010.

Position: **Senior Developer – Team Lead**

Location: London, Ontario.

Overview: We are currently seeking a **Senior Developer** for our ***Systems Technology Group*** based in ***London, Ontario.*** The Systems Technology Group plays a very important role in designing, implementing and managing the systems that enable the company's growth and success.

The role of the Senior Developer is to lead, support and enhance the development team in the delivery of several enterprise applications to ensure we continually meet our business's needs. This position is project focused. The successful candidate will also provide his/her expertise knowledge to other developers and associates.

Duties:

- Lead a team of developers to work on various projects
- Coordinate and work with other process areas including Project Management, Management, Quality Assurance, Business Analyst, internal & external peers
- Contribute, develop and follow the Project Development Life Cycle (PDLC)
- Identify and implement development toolsets to optimize staff
- Provide technical guidance, mentorship, and coaching to technical resources
- Review developers designs, test coverage, etc., participate in code reviews and promote continuous improvement
- Resolve team staffing or scheduling conflicts with projects
- Meet with clients to scope out project requirements and create required documents
- Self-motivated, well-organized, team player capable of participating in a very dynamic environment
- Communicate application problems, issues and resolution to key stakeholders
- Other duties as assigned.

Required Qualifications *(please only apply if you meet all required qualifications)*:

- A college diploma in Technology or equivalent
- 10 years of Visual Studio development experience (MS Development tool)
- 3-5 years of experience leading a team of developers
- Understanding of various PDLC's models.
- Experience designing, implementing and supporting applications using the following technologies: HTML, CSS, ASP.net, C#, VB.net, Ajax, Json, XML/XSLT.
- Understanding of relational Databases such as MS SQL
- Ability to understand and write complex SQL.
- Able to work over-time when required

Careers

Avatar Interactive is an established internet marketing agency in London, Ontario servicing clients from a variety of industries. We've recently added some great new clients and we need to expand our design and development team. As an agency, we are required to work with multiple clients on multiple projects simultaneously so an ability and commitment to deliver projects on time is a MUST. The nature of our business requires excellent communication skills with both clients and our internal team.

Compensation is commensurate with experience, please state your requirements. Please send your resume to [illegible]

Web Developer/Programmer

Employment type: Contract or Full time

Essential:

- Capable of creating user friendly/aesthetically pleasing websites
- Expert HTML, PHP and CSS skills
- Comfortable working in and around complex PHP code
- Experience working with Drupal and/or Wordpress e.g. creating custom Drupal themes/WP Templates
- Familiar with ActionScript, JavaScript, ASP
- Solid production skills for all browsers and platforms
- Experience with Apache and IIS

Desirable:

- University or college graduate
- SEO, SEM, Analytics or any general internet marketing/advertising experience
- Experience with E-commerce websites

Duties & Responsibilities:

- Develop and maintain corporate and marketing websites for our clients using PHP/HTML/CSS with popular open source CMS's (WordPress & Drupal)
- Create web forms with server-side field validation
- Convert Photoshop mockups into websites, Drupal themes and/or Wordpress templates
- Writing cross browser compliant CSS
- Install and configure Google analytics

Web Designer/Developer

Employment type: Contract or Full time

Essential:

- Capable of creating user friendly/aesthetically pleasing websites
- Expert HTML and CSS skills
- Solid design, typesetting and production skills for all browsers and platforms
- Superior skills in Adobe Photoshop and Adobe Illustrator as well as XHTML, DHTML JavaScript, XML, Actionscript
- Proficiency using Flash, Dreamweaver, Adobe Indesign
- Experience with PHP or other server-side scripting languages
- Experience producing banner ad creative to IAB guidelines

Desirable:

- University or college graduate
- SEO, SEM, Analytics or any general internet marketing/advertising experience
- Experience with E-commerce websites

Duties & Responsibilities:

Marketing

An Internet Applications and Web Development program at Fanshawe would be strongly positioned to offer a high-quality and attractive program for students wishing to pursue a career in web development. Due to the continued growth in internet applications and development this program is likely to draw student attention and being two years in length it is also within the funding parameters for second career and other funders who wish students to finish programs in a two year time frame. The program also has synergies with the Computer Programmer Analyst which will be highly marketable and a good transfer option for those students who find core programming a challenge or not to their liking. Fanshawe is well situated for growth in this program. Locally, there are several key players in the web development space including a local web gaming company. The London digital interactive industry is in a period of growth and it is one of the City of London priority areas which would suggest that graduates from this program would find employment opportunities within the London area and beyond.

A program like this would provide graduates with skills that are highly marketable and transferable. Graduates from this program, in addition, to having strong game development background will have exceptional programming skills that would be valuable in other areas outside the gaming industry. The program will have a relationship with other gaming grad programs at Fanshawe and will seek partnerships within the industry to keep the curriculum relevant and employment focused.

Upon approval of this program, the School of Information Technology will undertake a targeted marketing campaign targeting high school and mature students. Online campaigns will be utilized to spread the word about this program and to draw students from other areas outside the local catchment. While there has been some international enrolment in the existing web program, getting a diploma will be more attractive than a certificate so some modest growth is anticipated.

Proposed Start Date

September 2011

(Note: intakes for BIS and WDF would be suspended starting September 2011)

Proposed Target

30 students

(Note: it is anticipated the program will gain students in subsequent levels who are not the proper fit for the CPA program)

Internet Applications and Web Development (2 year Diploma)

Semester	Hours	Course	Offered	Comments
1	1	BUSI-1060 Strategies for Success	Fall, Winter	*Runs concurrent with CPA, CTN, CTY*
	5	INFO-1135 Networking Fundamentals CCNA 1	Fall, Winter	*Runs concurrent with CPA, CTN, CTY*
	5	INFO-1150 Programming Fundamentals	Fall, Winter	*Runs concurrent with CPA, CTN, CTY*
	3	INFO-1119 Operating Systems & Hardware Fundamentals	Fall, Winter	*Runs concurrent with CPA, CTN, CTY*
	3	INFO-1120 Database Fundamentals	Fall, Winter	*Runs concurrent with CPA, CTN, CTY*
	3	WRIT-1043 Reason & Writing 1 for IT	Fall, Winter	*Runs concurrent with CPA, CTN, CTY*
	20			
2	3	BUSI-1005 Introduction to Business Processes **	Winter, Summer	*Runs concurrent with CPA*
	4	INFO-1148 Web Design	Winter, Summer	*Runs concurrent with CPA*
	3	INFO-3061 Object Oriented Programming with Java	Winter, Summer	*Runs concurrent with CPA*
	3	INFO-XXXX Relational Databases & SQL	Winter, Summer	*Runs concurrent with CPA (Assumes 1 hour will be removed from INFO-3093 for CPA as well)*
	4	INFO-3091 ASP.NET Programming	Winter, Summer	
	3	MGMT-3052 Understanding Workplace Behavior **	Winter, Summer	*Runs concurrent with CPA*
	20			
3	3	INFO-1131 Graphics	Fall	
	5	INFO-3083 PHP	Fall	
	3	INFO-3097 Mobile Development	Fall	*Runs concurrent with CPA*
	3	INFO-3069 Web Applications & Technologies	Fall	
	3	INFO-5052 Advanced Databases	Fall	*Runs concurrent with CPA*
	3	COMM-3047 Communication for IT Professionals	Fall	*Runs concurrent with CPA*
	20			
4	3	Gen Ed Elective	Winter	
	3	INFO-5054 Application Project	Winter	
	3	INFO-3085 Web Servers	Winter	
	3	INFO-5064 Web Programming with XML	Winter	
	3	INFO-3084 Security	Winter	
	3	INFO-3086 Web Standards	Winter	
	18			

ONTARIO COLLEGES OF APPLIED ARTS AND TECHNOLOGY

CREDENTIALS VALIDATION SERVICE

APPLICATION FOR PROGRAM VALIDATION

This proposal will be sent to MTCU for Approval for Funding ___✓___Yes ____ No

1. College: Fanshawe College

2. College contact person responsible for this proposal:

   Name: Kevin Weaver

   Title: Chair, School of Information Technology

   Telephone: 519-452-4430 x.4629

   Electronic mail: kweaver@fanshawec.ca

3. Proposed Program Title: Internet Applications and Web Development

4. Proposed Credential: (please indicate below)

   Local Board Approved Certificate ☐

   Ontario College Certificate ☐

   Ontario College Diploma ✓

   Ontario College Advanced Diploma ☐

   Ontario College Graduate Certificate ☐

5. Proposed Program Outcomes:

   Please complete and attach the two Program Maps (Appendix A - Form 1 and Form 2)

6. Proposed Program Description:

   Please complete and attach the Program Description Form (Appendix B)

7. Proposed Program Curriculum:

   Please complete and attach the Program Curriculum Form (Appendix C)

8. Proposed Program Certification/Accreditation:

Please complete and attach the Regulatory Status Form (Appendix D)

9. Date of Submission:

10. Date of CVS Response:

11. Validation Decision:

☐ Proposal Validated (APS Number:)

☐ Proposal not Validated. Reason:

Signed on behalf of CVS:

Send the completed form and required appendices to: klassen@ocqas.org . For detailed information on how to complete the Application for Program Validation, please refer to the Instructions for Submission document. For any additional information contact: College Credential Validation Service, 655 Bay Street, Suite 1010, Toronto, ON M5G 2K4; or by telephone at (416) 596-8799.

ONTARIO COLLEGES OF APPLIED ARTS AND TECHNOLOGY

CREDENTIALS VALIDATION SERVICE

APPENDIX A - PROGRAM MAPS

(Vocational Program Outcomes & Essential Employability Skills Outcomes)

Vocational Program Learning Outcomes:

Form 1 (attached) is provided to assist you in mapping your proposed program vocational learning outcomes against existing vocational outcomes found in either Provincial Program Standards or in Provincial Program Descriptions. When completing this form, please be sure to include the MTCU code (where applicable) for the program category being referenced.

Where there is a relevant Provincial Program Standard, the approved Vocational Learning Outcomes must appear in the first column, followed by your proposed program vocational learning outcomes.

Where there are no Provincial Program Standards, the first column will contain program outcomes from the Provincial Program Description. Again, your proposed program vocational learning outcomes will be added in the middle column.

NOTE: ***Both these types of documents can be obtained from staff at the CVS or at the Colleges Branch, MTCU.***

The last column will contain a list of the relevant curriculum proposed in your program to address the outcome in a manner that ensures the graduate will have reliably demonstrated the required skill or ability. Course numbers or course codes, corresponding to those provided in your list of courses (Appendix C), are sufficient in this column.

Essential Employability Skills Outcomes:

A mapping of the Essential Employability Skills (EES) will be done on Form 2 (attached).

The instructions / requirements for this map are the same as for the Vocational Program Map. The first three columns contain the approved skill categories, the defining skills, and the EES learning outcomes. The last column will contain the proposed curriculum (as listed in Appendix C) that will ensure the meeting of these outcomes.

ONTARIO COLLEGES OF APPLIED ARTS AND TECHNOLOGY

CREDENTIALS VALIDATION SERVICE

APPENDIX A - PROGRAM MAPS

Form 1 - Vocational Program Outcomes

PROVINCIAL PROGRAM STANDARD VOCATIONAL LEARNING OUTCOMES / PROVINCIAL PROGRAM DESCRIPTION OUTCOMES (MTCU code)	PROPOSED PROGRAM VOCATIONAL LEARNING OUTCOMES	COURSE TITLE / COURSE CODE (From Appendix C)
1. Relate effectively to web development supervisors, coworkers, and clients.		WRIT-1043 Reason & Writing 1 for IT INFO-3061 Object Oriented Programming with Java INFO-XXXX Relational Databases & SQL INFO-3091 ASP.NET Programming MGMT-3052 Understanding Workplace Behaviour INFO-3083 PHP INFO-3069 Web Applications & Technologies INFO-5052 Advanced Databases

		COMM-3047 Communication for IT Professionals INFO-5054 Application Project INFO-3085 Web Servers INFO-5064 Web Programming with XML INFO-3084 Security
2. Configure and maintain internet services, internet application servers, database servers, and network services.		INFO-1135 Networking Fundamentals CCNA 1 INFO-1119 Operating Systems & Hardware Fundamentals INFO-XXXX Relational Databases & SQL INFO-5052 Advanced Databases INFO-5054 Application Project INFO-3085 Web Servers INFO-5064 Web Programming with XML INFO-3084 Security INFO-3086 Web Standards
3. Construct, modify, implement, query, and maintain effective databases, and interface with applications.		INFO-1120 Database Fundamentals INFO-XXXX Relational Databases & SQL INFO-3091 ASP.NET Programming INFO-3083 PHP INFO-3097 Mobile Development INFO-3069 Web Applications & Technologies INFO-5052 Advanced Databases INFO-5054 Application Project INFO-5064 Web Programming with

		XML INFO-3084 Security
4. Develop internet services and web application security by applying appropriate techniques and strategies.		INFO-1135 Networking Fundamentals CCNA 1 INFO-3083 PHP INFO-3097 Mobile Development INFO-5054 Application Project INFO-3085 Web Servers INFO-3084 Security
5. Program and debug internet applications using a variety of client-side and server side development languages.		INFO-1150 Programming Fundamentals INFO-3061 Object Oriented Programming with Java INFO-3091 ASP.NET Programming INFO-3083 PHP INFO-3097 Mobile Development INFO-3069 Web Applications & Technologies INFO-5054 Application Project INFO-5064 Web Programming with XML INFO-3084 Security
6. Develop, deploy, and maintain electronic commerce (e-commerce) applications.		INFO-1150 Programming Fundamentals BUSI-1005 Introduction to Business Processes INFO-3091 ASP.NET Programming INFO-3083 PHP INFO-3097 Mobile Development INFO-3069 Web Applications &

		Technologies INFO-5052 Advanced Databases INFO-5054 Application Project INFO-3084 Security
7. Create and maintain functional and dynamic websites by applying graphic and web design skills and principles.		INFO-1148 Web Design INFO-3091 ASP.NET Programming INFO-1131 Graphics INFO-3083 PHP INFO-3097 Mobile Development INFO-5054 Application Project INFO-3086 Web Standards
8. Develop and maintain websites reflective of business objectives and clients' needs through the application of advertising and marketing principles.		BUSI-1005 Introduction to Business Processes INFO-3083 PHP INFO-3069 Web Applications & Technologies INFO-5054 Application Project INFO-3084 Security INFO-3086 Web Standards
9. Adhere to relevant laws and industry standards.		INFO-1150 Programming Fundamentals INFO-1119 Operating Systems & Hardware Fundamentals INFO-1120 Database Fundamentals INFO-1148 Web Design INFO-3061 Object Oriented Programming with Java INFO-XXXX Relational Databases & SQL INFO-3091 ASP.NET Programming

		MGMT-3052 Understanding Workplace Behaviour INFO-3083 PHP INFO-3097 Mobile Development INFO-3069 Web Applications & Technologies INFO-5052 Advanced Databases COMM-3047 Communication for IT Professionals INFO-5054 Application Project INFO-3085 Web Servers INFO-5064 Web Programming with XML INFO-3084 Security INFO-3086 Web Standards
10. Coordinate or participate as a member of a project management team that develops internet applications.		INFO-3083 PHP INFO-5054 Application Project INFO-3085 Web Servers INFO-3084 Security
11. Develop strategies for ongoing personal and professional development that will lead to enhanced work performance and career opportunities, and keep pace with industry changes.		BUSI-1060 Strategies for Success WRIT-1043 Reason & Writing 1 for IT MGMT-3052 Understanding Workplace Behaviour COMM-3047 Communication for IT Professionals INFO-5054 Application Project INFO-3086 Web Standards Gen Ed Elective

ONTARIO COLLEGES OF APPLIED ARTS AND TECHNOLOGY

CREDENTIALS VALIDATION SERVICE

APPENDIX A - PROGRAM MAPS

Form 2 - Essential Employability Skills Outcomes

SKILL CATEGORIES	DEFINING SKILLS Skill areas to be demonstrated by the graduates	ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES The graduate has reliably demonstrated the ability to:	COURSE TITLE / COURSE CODE (From Appendix C)
COMMUNICATION	• Reading • Writing • Speaking • Listening • Presenting • Visual Literacy	➢ communicate clearly, concisely, and correctly in the written, spoken, and visual form that fulfils the purpose and meets the needs of the audience	BUSI-1060 Strategies for Success INFO-1135 Networking Fundamentals CCNA 1 INFO-1150 Programming Fundamentals INFO-1120 Database Fundamentals WRIT-1043 Reason & Writing 1 for IT BUSI-1005 Introduction to Business Processes INFO-1148 Web Design INFO-3061 Object Oriented

SKILL CATEGORIES	DEFINING SKILLS Skill areas to be demonstrated by the graduates	ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES The graduate has reliably demonstrated the ability to:	COURSE TITLE / COURSE CODE (From Appendix C)
			Programming with Java INFO-XXXX Relational Databases & SQL INFO-3091 ASP.NET Programming MGMT-3052 Understanding Workplace Behaviour INFO-1131 Graphics INFO-3069 Web Applications & Technologies INFO-5052 Advanced Databases COMM-3047 Communication for IT Professionals Gen Ed Elective INFO-5054 Application Project INFO-3085 Web Servers INFO-5064 Web Programming with XML INFO-3084 Security INFO-3086 Web Standards
		➢ respond to written, spoken, or visual messages in a manner that ensures	BUSI-1060 Strategies for Success INFO-1135 Networking Fundamentals CCNA 1

SKILL CATEGORIES	DEFINING SKILLS Skill areas to be demonstrated by the graduates	ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES The graduate has reliably demonstrated the ability to:	COURSE TITLE / COURSE CODE (From Appendix C)
		effective communication	INFO-1150 Programming Fundamentals INFO-1119 Operating Systems & Hardware Fundamentals INFO-1120 Database Fundamentals WRIT-1043 Reason & Writing 1 for IT BUSI-1005 Introduction to Business Processes INFO-1148 Web Design INFO-XXXX Relational Databases & SQL INFO-3091 ASP.NET Programming MGMT-3052 Understanding Workplace Behaviour INFO-1131 Graphics INFO-3097 Mobile Development INFO-3069 Web Applications & Technologies INFO-5052 Advanced Databases

SKILL CATEGORIES	DEFINING SKILLS Skill areas to be demonstrated by the graduates	ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES The graduate has reliably demonstrated the ability to:	COURSE TITLE / COURSE CODE (From Appendix C)
			COMM-3047 Communication for IT Professionals Gen Ed Elective INFO-5054 Application Project INFO-3085 Web Servers INFO-5064 Web Programming with XML INFO-3084 Security INFO-3086 Web Standards
NUMERACY	• Understanding and applying mathematical concepts and reasoning • Analysing and using numerical data • Conceptualizing	➢ execute mathematical operations accurately	INFO-1135 Networking Fundamentals CCNA 1 INFO-1150 Programming Fundamentals INFO-1120 Database Fundamentals BUSI-1005 Introduction to Business Processes INFO-3061 Object Oriented Programming with Java INFO-XXXX Relational Databases & SQL

SKILL CATEGORIES	DEFINING SKILLS Skill areas to be demonstrated by the graduates	ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES The graduate has reliably demonstrated the ability to:	COURSE TITLE / COURSE CODE (From Appendix C)
			INFO-3091 ASP.NET Programming INFO-3069 Web Applications & Technologies INFO-5052 Advanced Databases Gen Ed Elective INFO-3085 Web Servers INFO-5064 Web Programming with XML INFO-3086 Web Standards
CRITICAL THINKING & PROBLEM SOLVING	• Analysing • Synthesizing • Evaluating • Decision-making • Creative and innovative thinking	➢ apply a systematic approach to solve problems	BUSI-1060 Strategies for Success INFO-1135 Networking Fundamentals CCNA 1 INFO-1150 Programming Fundamentals INFO-1119 Operating Systems & Hardware Fundamentals INFO-1120 Database Fundamentals WRIT-1043 Reason & Writing 1 for IT BUSI-1005 Introduction to Business

SKILL CATEGORIES	DEFINING SKILLS Skill areas to be demonstrated by the graduates	ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES The graduate has reliably demonstrated the ability to:	COURSE TITLE / COURSE CODE (From Appendix C)
			Processes INFO-1148 Web Design INFO-3061 Object Oriented Programming with Java INFO-XXXX Relational Databases & SQL INFO-3091 ASP.NET Programming MGMT-3052 Understanding Workplace Behaviour INFO-1131 Graphics INFO-3083 PHP INFO-3097 Mobile Development INFO-3069 Web Applications & Technologies INFO-5052 Advanced Databases COMM-3047 Communication for IT Professionals Gen Ed Elective INFO-5054 Application Project INFO-3085 Web Servers

SKILL CATEGORIES	DEFINING SKILLS Skill areas to be demonstrated by the graduates	ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES The graduate has reliably demonstrated the ability to:	COURSE TITLE / COURSE CODE (From Appendix C)
			INFO-5064 Web Programming with XML INFO-3084 Security INFO-3086 Web Standards
		➢ use a variety of thinking skills to anticipate and solve problems	BUSI-1060 Strategies for Success INFO-1135 Networking Fundamentals CCNA 1 INFO-1150 Programming Fundamentals INFO-1119 Operating Systems & Hardware Fundamentals INFO-1120 Database Fundamentals WRIT-1043 Reason & Writing 1 for IT BUSI-1005 Introduction to Business Processes INFO-1148 Web Design INFO-3061 Object Oriented Programming with Java INFO-XXXX Relational Databases &

SKILL CATEGORIES	DEFINING SKILLS Skill areas to be demonstrated by the graduates	ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES The graduate has reliably demonstrated the ability to:	COURSE TITLE / COURSE CODE (From Appendix C)
			SQL INFO-3091 ASP.NET Programming MGMT-3052 Understanding Workplace Behaviour INFO-1131 Graphics INFO-3083 PHP INFO-3097 Mobile Development INFO-3069 Web Applications & Technologies INFO-5052 Advanced Databases COMM-3047 Communication for IT Professionals Gen Ed Elective INFO-5054 Application Project INFO-3085 Web Servers INFO-5064 Web Programming with XML INFO-3084 Security INFO-3086 Web Standards

SKILL CATEGORIES	DEFINING SKILLS Skill areas to be demonstrated by the graduates	ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES The graduate has reliably demonstrated the ability to:	COURSE TITLE / COURSE CODE (From Appendix C)
INFORMATION MANAGEMENT	• Gathering and managing information • Selecting and using appropriate tools and technology for a task or a project • Computer literacy • Internet skills	➢ locate, select, organize, and document information using appropriate technology and information systems	BUSI-1060 Strategies for Success INFO-1135 Networking Fundamentals CCNA 1 INFO-1150 Programming Fundamentals INFO-1119 Operating Systems & Hardware Fundamentals INFO-1120 Database Fundamentals WRIT-1043 Reason & Writing 1 for IT BUSI-1005 Introduction to Business Processes INFO-1148 Web Design INFO-3061 Object Oriented Programming with Java INFO-XXXX Relational Databases & SQL INFO-3091 ASP.NET Programming MGMT-3052 Understanding Workplace Behaviour

SKILL CATEGORIES	DEFINING SKILLS Skill areas to be demonstrated by the graduates	ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES The graduate has reliably demonstrated the ability to:	COURSE TITLE / COURSE CODE (From Appendix C)
			INFO-1131 Graphics INFO-3083 PHP INFO-3097 Mobile Development INFO-3069 Web Applications & Technologies INFO-5052 Advanced Databases COMM-3047 Communication for IT Professionals Gen Ed Elective INFO-5054 Application Project INFO-3085 Web Servers INFO-5064 Web Programming with XML INFO-3086 Web Standards
		➢ analyse, evaluate, and apply relevant information from a variety of sources	BUSI-1060 Strategies for Success INFO-1135 Networking Fundamentals CCNA 1 INFO-1150 Programming Fundamentals INFO-1120 Database Fundamentals

SKILL CATEGORIES	DEFINING SKILLS Skill areas to be demonstrated by the graduates	ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES The graduate has reliably demonstrated the ability to:	COURSE TITLE / COURSE CODE (From Appendix C)
			WRIT-1043 Reason & Writing 1 for IT BUSI-1005 Introduction to Business Processes INFO-1148 Web Design INFO-3061 Object Oriented Programming with Java INFO-XXXX Relational Databases & SQL INFO-3091 ASP.NET Programming MGMT-3052 Understanding Workplace Behaviour INFO-1131 Graphics INFO-3097 Mobile Development INFO-3069 Web Applications & Technologies INFO-5052 Advanced Databases COMM-3047 Communication for IT Professionals Gen Ed Elective

SKILL CATEGORIES	DEFINING SKILLS Skill areas to be demonstrated by the graduates	ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES The graduate has reliably demonstrated the ability to:	COURSE TITLE / COURSE CODE (From Appendix C)
			INFO-5054 Application Project INFO-3085 Web Servers INFO-5064 Web Programming with XML INFO-3084 Security INFO-3086 Web Standards
INTER-PERSONAL	• Team work • Relationship management • Conflict resolution • Leadership • Networking	➢ show respect for the diverse opinions, values, belief systems, and contributions of others	BUSI-1060 Strategies for Success INFO-1135 Networking Fundamentals CCNA 1 WRIT-1043 Reason & Writing 1 for IT BUSI-1005 Introduction to Business Processes INFO-1148 Web Design INFO-3061 Object Oriented Programming with Java INFO-3091 ASP.NET Programming MGMT-3052 Understanding Workplace Behaviour INFO-1131 Graphics

SKILL CATEGORIES	DEFINING SKILLS Skill areas to be demonstrated by the graduates	ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES The graduate has reliably demonstrated the ability to:	COURSE TITLE / COURSE CODE (From Appendix C)
			INFO-3069 Web Applications & Technologies COMM-3047 Communication for IT Professionals Gen Ed Elective INFO-5054 Application Project INFO-5064 Web Programming with XML INFO-3086 Web Standards
		➢ interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals	INFO-1135 Networking Fundamentals CCNA 1 INFO-1120 Database Fundamentals WRIT-1043 Reason & Writing 1 for IT BUSI-1005 Introduction to Business Processes INFO-1148 Web Design INFO-3061 Object Oriented Programming with Java INFO-XXXX Relational Databases &

SKILL CATEGORIES	DEFINING SKILLS Skill areas to be demonstrated by the graduates	ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES The graduate has reliably demonstrated the ability to:	COURSE TITLE / COURSE CODE (From Appendix C)
			SQL MGMT-3052 Understanding Workplace Behaviour INFO-1131 Graphics COMM-3047 Communication for IT Professionals Gen Ed Elective INFO-5054 Application Project INFO-3085 Web Servers INFO-5064 Web Programming with XML INFO-3086 Web Standards
PERSONAL	• Managing self • Managing change and being flexible and adaptable • Engaging in reflective practices	➢ manage the use of time and other resources to complete projects	BUSI-1060 Strategies for Success INFO-1135 Networking Fundamentals CCNA 1 INFO-1150 Programming Fundamentals INFO-1119 Operating Systems & Hardware Fundamentals INFO-1120 Database Fundamentals

SKILL CATEGORIES	DEFINING SKILLS Skill areas to be demonstrated by the graduates	ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES The graduate has reliably demonstrated the ability to:	COURSE TITLE / COURSE CODE (From Appendix C)
	• Demonstrating personal responsibility		WRIT-1043 Reason & Writing 1 for IT BUSI-1005 Introduction to Business Processes INFO-1148 Web Design INFO-3061 Object Oriented Programming with Java INFO-XXXX Relational Databases & SQL INFO-3091 ASP.NET Programming MGMT-3052 Understanding Workplace Behaviour INFO-1131 Graphics INFO-3083 PHP INFO-3097 Mobile Development INFO-3069 Web Applications & Technologies INFO-5052 Advanced Databases COMM-3047 Communication for IT Professionals

SKILL CATEGORIES	DEFINING SKILLS Skill areas to be demonstrated by the graduates	ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES The graduate has reliably demonstrated the ability to:	COURSE TITLE / COURSE CODE (From Appendix C)
			Gen Ed Elective INFO-5054 Application Project INFO-3085 Web Servers INFO-5064 Web Programming with XML INFO-3086 Web Standards
		➢ take responsibility for one's own actions, decisions, and consequences	INFO-1135 Networking Fundamentals CCNA 1 INFO-1150 Programming Fundamentals INFO-1119 Operating Systems & Hardware Fundamentals INFO-1120 Database Fundamentals WRIT-1043 Reason & Writing 1 for IT BUSI-1005 Introduction to Business Processes INFO-1148 Web Design INFO-3061 Object Oriented Programming with Java

SKILL CATEGORIES	DEFINING SKILLS Skill areas to be demonstrated by the graduates	ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES The graduate has reliably demonstrated the ability to:	COURSE TITLE / COURSE CODE (From Appendix C)
			INFO-XXXX Relational Databases & SQL INFO-3091 ASP.NET Programming MGMT-3052 Understanding Workplace Behaviour INFO-1131 Graphics INFO-3069 Web Applications & Technologies INFO-5052 Advanced Databases COMM-3047 Communication for IT Professionals Gen Ed Elective INFO-5054 Application Project INFO-3085 Web Servers INFO-5064 Web Programming with XML INFO-3084 Security INFO-3086 Web Standards

ONTARIO COLLEGES OF APPLIED ARTS AND TECHNOLOGY

CREDENTIALS VALIDATION SERVICE

APPENDIX B - PROGRAM DESCRIPTION

PROGRAM DESCRIPTION:

The Internet Applications and Web Development Ontario College Diploma program prepares students to work in the growing field of web-centric business application development. The focus of the program is on the construction of various types of web applications using leading web environments, tools, servers, databases and languages. In addition, students will learn the fundamentals of both business and technology. They will develop an understanding of basic hardware, networking and operating systems as well as the installation and configuration of web and e-mail servers in Windows and Linux. Training will include the installation and development of corporate web-enabled databases. Students will gain the knowledge required to build secure, reliable and useful web applications using industry standard photo, graphics, animation, database, page design and programming tools.

Graduates will typically find employment as entry-level web developers, web technicians, web masters, web programmers, web site developers, internet site developers, e-commerce web site developers, web administrators, Internet programmers or as members of an integrated web development team. They will be employed in computer software development firms, information technology consulting firms and in information technology units throughout the private and public sectors, and many may choose to become independent contractors.

VOCATIONAL PROGRAM LEARNING OUTCOMES: (vocational program learning outcomes must be consistent with the requirements of the Credentials Framework for the proposed credential)

The graduate has reliably demonstrated the ability to:

1. relate effectively to web development supervisors, co-workers, and clients
2. configure and maintain internet services, internet application servers, database servers, and network services

3. construct, modify, implement, query, and maintain effective databases, and interface with applications
4. develop internet services and web application security by applying appropriate techniques and strategies
5. program and debug internet applications using a variety of client-side and server-side development languages
6. develop, deploy, and maintain electronic commerce (e-commerce) applications
7. create and maintain functional and dynamic websites by applying graphic and web design skills and principles
8. develop and maintain websites reflective of business objectives and clients' needs through the application of advertising and marketing principles
9. adhere to relevant laws and industry standards
10. coordinate or participate as a member of a project management team that develops internet applications
11. develop strategies for ongoing personal and professional development that will lead to enhanced work performance and career opportunities, and keep pace with industry changes

ADMISSION REQUIREMENTS:

OSSD with courses from the College (C), University (U), University/College (U/C), or Open (O) stream WITH:

- Any Grade 12 English (C) or (U)
- Any Grade 11 or Grade 12 Mathematics* (C), (U) or (U/C)

OR

Academic and Career Entrance Certificate (ACE)**

OR

Pre-Technology Ontario College Certificate**

OR

Ontario High School Equivalency Certificate (GED) AND:

- Any Grade 11 or Grade 12 Mathematics* (C), (U) or (U/C)

OR

Mature Applicant with standing in the required courses stated above

ONTARIO COLLEGES OF APPLIED ARTS AND TECHNOLOGY

CREDENTIALS VALIDATION SERVICE

APPENDIX C - PROGRAM CURRICULUM

Semester	Course Code*	Course Title (and brief course description)
1	BUSI-1060	Strategies for Success This course presents and helps to develop some of the skills required to achieve college and career success. Areas of focus include: emotional self-awareness and social skills, goal-setting, time management, note-taking, test preparation strategies, and managing college life
1	INFO-1135	Networking Fundamentals-CCNA1 This course provides students with a comprehensive overview of networking; from fundamentals to advanced applications, thereby providing a solid foundation upon which to build their Local Area Network (LAN) and Wide Area Network (WAN) training. It is based on a top-down approach to networking and emphasizes the concepts and skills required to design networks, while providing opportunities for practical application and hands-on experience by teaching students how to install, operate, and maintain networks
1	INFO-1150	Programming Fundamentals This course is an introduction to software design and construction using an object-oriented programming language (Java). The first five weeks of the course will cover the fundamental computing concepts of creating variables and manipulating them using sequential execution, conditional statements and looping constructs. When these fundamentals have been mastered, the students will apply their programming knowledge to produce simple, practical applications capable of accepting data input from users, processing that input, and then producing useful output. Later, the students will then be introduced to object-oriented programming concepts of class and object and will write classes to represent simple real-world entities
1	INFO-1119	Operating Systems & Hardware Fundamentals This course deals with the concepts of computer hardware and software structure. It includes the components of a computer and

		how they relate to one another. In addition, the parts of the operating system and how they work together with the hardware to support application programs will be described
1	INFO-1120	Database Fundamentals This course is an introduction to the design and development of database systems. A data-modeling tool based upon the Unified Modeling Language will be used to capture and refine the student's database designs. Subsequently, these designs will be transformed into a working database. The student will have an opportunity to build and test their database designs using two different database products
1	WRIT-1043	Reason & Writing 1 for IT This course will introduce information technology students to essential principles of reading, writing, and reasoning at the postsecondary level. Students will identify, summarize, analyze, and evaluate multiple short readings and write persuasive response essays to develop their vocabulary, comprehension, grammar, and critical thinking
2	BUSI-1005	Introduction to Business Processes *(mandatory gen ed)* The purpose of this course is to explore the various functional areas of business in Canada and to demonstrate the interrelationship among these areas. Students are introduced to many concepts, including major business trends, the role of government in business, marketing, operations, employee-management issues, financial resources management, business ethics, social responsibility and community-related philanthropy
2	INFO-1148	Web Design This course will focus on Web-based applications that are becoming prevalent due to the adoption of browser application interface and e-commerce strategies in the workplace. Students will learn to design and create customer-oriented Web sites, deploying the latest web standards. They will learn how to publish online and optimize a site including marketing
2	INFO-3061	Object Oriented Programming with Java The course will consist of three units. In the first unit, students will be given a brief introduction to recursion and how it can be useful in solving certain types of computational problems. Then, the different types of data storage structures from the Java Collections classes will be examined. Students will instantiate and use various collection objects such as Vectors, Array Lists, Lists, Stacks, Queues, Maps, and Hash Tables. The second unit will cover the three foundation concepts of object-oriented programming; encapsulation, inheritance, and polymorphism.

		Students will write their own classes to create objects that will implement each of these concepts. Object-oriented development using UML analysis techniques and notation will be introduced. Java's exception handling framework will be introduced. Students will write exception handling code for various types of checked and unchecked exceptions, and will also be able to write their own custom exception handling classes. In the third unit the basics of GUI and event-driven programming in Java will be introduced. Students will create applications utilizing classes from Java's Swing package that utilize listeners to implement Java's event-delegation model to respond to user and system initiated events
2	INFO-XXXX	Relational Databases & SQL This course builds on the concepts of the relational database presented in INFO1120 Database Fundamentals and introduces the student to larger client/server database systems. Oracle is used as the database platform to demonstrate the operation of larger multi-user systems. Upon completion the student will have demonstrated the ability to: solve problems by designing database entities base on real world scenarios, execute mathematical operations accurately by planning database sizes, as well as analyze, evaluate, and apply relevant information from a variety of sources from the internet. In particular emphasis is placed on mastering the fundamentals of Structured Query Language (SQL) for creating and maintaining database objects, complex queries, and the tool to perform typical database administrative tasks
2	INFO-3091	ASP.NET Programming In this course the student will be working directly withASP.Net (Active Server Pages) to understand how ASP.Net is an effective solution to building intranet/internet applications. By working with other Windows based server components such as IIS, SQL Server, the .Net framework and ADO.NET the student will also learn how they interact with one another
2	MGMT-3052	Understanding Workplace Behaviours *(mandatory gen ed)* This course provides a broad understanding of the workplace by investigating individual, group and organizational behaviours. Students will be given the opportunity to assess their own behaviours while observing and discussing the diverse behaviours of others as they interact in various capacities, situations and assorted environments. By studying human social behaviour under the context of an organization, students should experience an easier transition while adjusting to any changes in future workplace and/or career choices
3	INFO-1131	Graphics

		This course focuses on creating rich web graphics with various tools. The student will first learn the principles of graphic design and how to apply those principles to create intuitive, interactive and accessible web sites. Fireworks will be used to create and edit both vector and bitmap graphics, create disjointed rollovers and buttons, and optimize and export those graphics for use online. Students will also be exposed to Flash where emphasis will be placed on creating multi-media rich, interactive sites and stand alone applications
3	INFO-3083	PHP This course is a comprehensive hands-on tutorial in the construction of complex web applications using PHP. Server configurations also explained to enhance the student's understanding of web application development and hosting
3	INFO-3097	Mobile Development In this course, students will learn how to design and implement mobile device applications for multiple platforms. The emphasis will be on the employment of main stream strategies and practices that target both web and device specific applications. In addition, students will have opportunities to work with several cross-platform APIs and programming languages, using various emulation environments.
3	INFO-3069	Web Applications & Technologies The main focus for this course is to provide the student with the opportunity to work with several specialized web and internet related development strategies. The work will be based on selected topics chosen by the faculty member and will typically involve products and practices from either Microsoft or non-Microsoft (LAMP) environments. The emphasis will be on working with leading edge technologies. As the Internet is a continuously evolving entity, students need the opportunity to work with the latest and most innovative web development practices. Since each offering of this course may have different applied content from previous offerings, students completing this course in their final year of study will be well prepared for this particular job market
3	INFO-5052	Advanced Databases This course will continue to build on knowledge that students have acquired from previous database courses. Students will be expected to design, implement and administer a database in the SQL Server environment. Advanced topics such as stored procedures, triggers, reporting, and various other complex administrative tasks will be covered

3	COMM-3047	Communication for IT Professionals This course develops IT students' business and technical communication skills in both oral and written formats. Students produce a variety of work-related documents appropriate for a professional, technological environment. These documents include an article summary, troubleshooting guide, instruction manual, along with short reports, letters, memos, and e-mails. Students use standard electronic communication technologies in this course and submit all assignments through FOL
4	INFO-5054	Application Project This course introduces the student to developing business application software as part of a team using Agile programming practices. The student teams will choose a development environment to create a term length, client or web solution for a project of their choice. Unlike all other software development courses within the program, this course provides students with an opportunity to create an end-to-end solution as a consolidation of all the individual skills which have been acquired in other parts of the program
4	INFO-3085	Web Servers This course is an introduction to Web servers. Topics include installation, configuration, maintenance, security, performance, and database connectivity using server side programming. Students will implement web sites using Internet Information Server (IIS) and the Apache HTTP server. Emphasis however will be on developing a general knowledge of all the aspects of a Web server in the Windows and Linux / Unix environments
4	INFO-5064	Web Programming with XML XML itself is a simple and flexible format for representing text-based data. Its claim to fame is that it has become the language of choice for exchanging data on the Web. While XML is simple and easy to learn, there are many other web development technologies that rely on or enhance the use of XML. This is a skills-oriented, survey-style course that will introduce the student to XML and some of the more popular and important related technologies
4	INFO-3084	Security Security has become a crucial issue for any business. As systems and networks become more accessible, the need to secure a site and the associated data becomes more acute. This course introduces the student to the basic issues associated with web based application security. Methods of preventing attacks on computer networks, web servers and other servers will be discussed. Development of security policies, conducting security audits and performing risk assessments will be explored

4	INFO-3086	Web Standards This course is an introduction to the professional development methodologies and standards used in the creation of web based solutions. Students will explore the various systems development life cycles that are used by web professionals in the creation of professional web solutions. Emphasis will be on the entire development of web applications, from creating aesthetically pleasing and functional web sites to publishing and marketing those sites to a global audience. A series of web related standards will be explored, discussed and utilized by students in a series of tutorial based assignments
4		Gen Ed Elective

Add additional rows as required to complete the curriculum chart.

* **(be sure to identify those courses designed to deliver General Education)**

ONTARIO COLLEGES OF APPLIED ARTS AND TECHNOLOGY

CREDENTIALS VALIDATION SERVICE

APPENDIX D – REGULATORY STATUS FORM

MANDATORY REGULATORY REQUIREMENTS

Where licensing or certification is ***required by legislation*** for entry to practice in the profession or trade, the Ministry of Training, Colleges and Universities requires that colleges ensure that their programs will meet the requirements of the regulatory body in order to be approved for funding.

☐ There is a legislative requirement that program graduates must be certified or licensed by a regulatory authority to practice or work in the occupation.

Name of regulatory authority_____

☐ (A*) The program has been accredited or approved by the regulatory authority or its identified third party?

OR

☐ (B*) The college is working toward accreditation with the regulatory authority.

Status of application and expected date of achievement_____

☐ (C*) If the regulatory authority does not accredit educational programs directly or by an identified third party, has it formally acknowledged (e.g. in its published or legislated registration requirements) that the program graduates will be eligible to write any required certifying or registration exam or that the program is otherwise recognized for the purposes of certifying or registering a graduate?

*Please submit an acknowledgement and/or evidence from the regulatory authority to support (a) or (b) or (c) above.

VOLUNTARY REQUIREMENTS

Colleges may choose to have a program accredited or recognized by a voluntary membership organization or association. Graduate eligibility for association recognition or adherence to standards imposed by the body is ***not a requirement*** for program funding approval by the Ministry of Training, Colleges and Universities.

Recognition of the program by a voluntary professional body:

☐ Is being sought: Name of professional body:

_____

☐ The college is working toward recognition.

Status of application and expected date of achievement:

_____

☐ Recognition has been received.

Type of recognition (e.g. accreditation, graduates eligible to write membership exams, etc.):_____

★ Please submit an acknowledgement and/or evidence from the voluntary association that recognition has been received.

☒ Recognition is not being sought *(please note there may be titling implications for programs that are not compliant in an area where other existing programs are)*.

PROGRAM MAPPING - Internet Applications and Web Development

PROGRAM VOCATIONAL LEARNING OUTCOMES 1 - Introductory 2 - Intermediate 3 - Advanced The graduate has reliably demonstrated the ability to: (Source: MTCU Code)	LEVEL ONE						LEVEL TWO					
	BuSI-1060 Strategies for Success	INFO-1135 Networking Fundamentals - CCNA1	INFO-1150 Programming Fundametnals	INFO-1119 Operating Systems & Hardware Fundamentals	INFO-1120 Database Fundamentals	WRIT-1043 Reason & Writing 1 for IT	BUSI-1005 Introduction to Business Processes (GM)	INFO-1148 Web Design	INFO-3061 Object Oriented Programming with Java	INFO-XXXX Relational Databases & SQL	INFO-3091 ASP.NET Programming	MGMT-3052 Understanding Workplace Behaviours (GM)
1. relate effectively to web development supervisors, coworkers, and clients.						1			1	1	1	1
2. configure and maintain internet services, internet application servers, database servers, and network services.		1		1						1		
3. construct, modify, implement, query, and maintain effective databases, and interface with applications.					1					2	1	
4. develop internet services and web application security by applying appropriate techniques and strategies.		1										
5. program and debug internet applications using a variety of client-side and serverside development languages.			1						2		2	
6. develop, deploy, and maintain electronic commerce (e-commerce) applications.			1				2				1	
7. create and maintain functional and dynamic websites by applying graphic and web design skills and principles.								2			1	
8. develop and maintain websites reflective of business objectives and clients' needs through the application of advertising and marketing principles.							2					
9. adhere to relevant laws and industry standards.			1	1	1			1	1	2	1	2
10. coordinate or participate as a member of a project management team that develops internet applications.												
11. develop strategies for ongoing personal and professional development that will lead to enhanced work performance and career opportunities, and keep pace with industry changes.	2					1						1
TOTAL # OF OUTCOMES EVALUATED BY EACH COURSE	1	2	3	2	2	2	2	2	3	4	6	3
V = Vocational Courses E = Essential Employability Skills Courses												
GM = General Education (mandatory) G = General Education (elective)												
NB - Only indicate the outcomes that are Taught & Evaluated (or TRE) in a course												
PROGRAM COORDINATOR: Jim Cooper												
ACADEMIC CHAIR: Kevin Weaver												
Date Completed: June 3, 2010												

PROGRAM MAPPING - Internet Applications and Web Development

PROGRAM VOCATIONAL LEARNING OUTCOMES 1 - Introductory 2 - Intermediate 3 - Advanced The graduate has reliably demonstrated the ability to: (Source: MTCU Code)	LEVEL THREE						LEVEL FOUR						# OF COURSES EVALUATING THE OUTCOME FOR THIS YEAR
	INFO-1131 Graphics	INFO-3083 PHP	INFO-3097 Mobile Development	INFO-3069 Web Applications & Technologies	INFO-5052 Advanced Databases	COMM-3047 Communication for IT Professionals	INFO-5054 Application Project	INFO-3085 Web Servers	INFO-5064 Web Programming with XML	INFO-3084 Security	INFO-3086 Web Standards	Gen Ed Elective (G)	
1. relate effectively to web development supervisors, coworkers, and clients.		1		2	2	2	3	3	2	3			13
2. configure and maintain internet services, internet application servers, database servers, and network services.				2			3	3	3	3	3		9
3. construct, modify, implement, query, and maintain effective databases, and interface with applications.		1	1	2	3		3		3	3			10
4. develop internet services and web application security by applying appropriate techniques and strategies.		2	2				3	3		3			6
5. program and debug internet applications using a variety of client-side and serverside development languages.		2	2	3			3		3	3			9
6. develop, deploy, and maintain electronic commerce (e-commerce) applications.		1	1	2	2		3			3			9
7. create and maintain functional and dynamic websites by applying graphic and web design skills and principles.	3	1	1				3				3		7
8. develop and maintain websites reflective of business objectives and clients' needs through the application of advertising and marketing principles.		2		2			3			3	3		6
9. adhere to relevant laws and industry standards.		2	2	2	2	2	3	3	3	3	3		18
10. coordinate or participate as a member of a project management team that develops internet applications.		2					3	3		3			4
11. develop strategies for ongoing personal and professional development that will lead to enhanced work performance and career opportunities, and keep pace with industry changes.						2	2				3	2	7
TOTAL # OF OUTCOMES EVALUATED BY EACH COURSE	1	9	6	7	4	3	11	5	5	9	5	1	
V = Vocational Courses E = Essential Employability Skills Courses													
GM = General Education (mandatory) G = General Education (elective)													
NB - Only indicate the outcomes that are Taught & Evaluated (or TRE)													
PROGRAM COORDINATOR: Jim Cooper													
ACADEMIC CHAIR: Kevin Weaver													
Date Completed: June 3, 2010													

PROGRAM MAPPING - Internet Applications and Web Development

PROGRAM ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES T = Taught R = Reinforced E = Evaluated R = 4 RE = 5 TE = 6 TRE = 7 **The graduate has reliably demonstrated the ability to: (Source: MTCU Code)**	LEVEL ONE						LEVEL TWO					
	BuSI-1060 Strategies for Success	INFO-1135 Networking Fundamentals - CCNA1	INFO-1150 Programming Fundamentals	INFO-1119 Operating Systems & Hardware Fundamentals	INFO-1120 Database Fundamentals	WRIT-1043 Reason & Writing 1 for IT	BUSI-1005 Introduction to Business Processes	INFO-1148 Web Design	INFO-3061 Object Oriented Programming with Java	INFO-XXXX Relational Databases & SQL	INFO-3091 ASP.NET Programming	MGMT-3052 Understanding Workplace Behaviours
1. communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.	7	4	6		4	7	7	6	6	4	5	4
2. respond to written, spoken, or visual messages in a manner that ensures effective communication.	7	4	7	5	7	7	7	6		4	4	4
3. execute mathematical operations accurately.		6	4		7		4		6	6	6	
4. apply a systematic approach to solve problems.	5	7	7	6	7	7	7	7	6	6	6	7
5. use a variety of thinking skills to anticipate and solve problems.	7	4	5	6	7	7	7	7	4	6	6	7
6. locate, select, organize, and document information using appropriate technology and information systems.	7	4	4	7	7		4	7	6	6	4	4
7. analyze, evaluate, and apply relevant information from a variety of sources.	7	5	4		7		4	4	4	6	6	7
8. show respect for the diverse opinions, values, belief systems, and contributions of others.	7	4				7	7	4	4		4	7
9. interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals.		4			4	4	7	4	4	4		7
10. manage the use of time and other resources to complete projects.	7	5	5	5	6	5	4	4	4	6	5	4
11. take responsibility for one's own actions, decisions, and consequences.	7	5	5	4	6	7	5	4	4	5	4	4
TOTAL # OF OUTCOMES SUPPORTED BY EACH COURSE	9	11	9	6	10	8	11	10	10	10	10	10

PROGRAM COORDINATOR: Jim Cooper

ACADEMIC CHAIR: Kevin Weaver

Date Completed: June 3, 2010

PROGRAM MAPPING - Internet Applications and Web Development

PROGRAM ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES T = Taught R = Reinforced E = Evaluated R = 4 RE = 5 TE = 6 TRE = 7 **The graduate has reliably demonstrated the ability to: (Source: MTCU Code)**	LEVEL THREE						LEVEL FOUR						
	INFO-1131 Graphics	INFO-3083 PHP	INFO-3097 Mobile Development	INFO-3069 Web Applications & Technologies	INFO-5052 Advanced Databases	COMM-3047 Communication for IT Professionals	INFO-5054 Application Project	INFO-3085 Web Servers	INFO-5064 Web Programming with XML	INFO-3084 Security	INFO-3086 Web Standards	Gen Ed Elective (G)	# OF COURSES EVALUATING THE OUTCOME FOR THIS YEAR
1. communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.	7			4	5	7	7	4	5	5	5		20
2. respond to written, spoken, or visual messages in a manner that ensures effective communication.	7		5	4	4	7	7	5	5	5	5		21
3. execute mathematical operations accurately.				5	6			6	7		7		12
4. apply a systematic approach to solve problems.	7	5	7	7	6	7	7	6	5	5	7		23
5. use a variety of thinking skills to anticipate and solve problems.	7	5	7	5	6	7	5	6	7	5	7		23
6. locate, select, organize, and document information using appropriate technology and information systems.	7	5	7	5	4	7	5	6	5		7		21
7. analyze, evaluate, and apply relevant information from a variety of sources.	4		5	7	6	7	5	6	5	7	7		20
8. show respect for the diverse opinions, values, belief systems, and contributions of others.	4			4		4	5		4		4		14
9. interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals.	4					5	7	4	4		4		14
10. manage the use of time and other resources to complete projects.	4	5	5	5	5	4	5	6	5		5		22
11. take responsibility for one's own actions, decisions, and consequences.	4			4	5	4	5	5	5	5	7		21
TOTAL # OF OUTCOMES SUPPORTED BY EACH COURSE	10	4	6	10	9	10	10	10	11	6	11	0	

PROGRAM COORDINATOR: Jim Cooper

ACADEMIC CHAIR: Kevin Weaver

Date Completed: June 3, 2010

FOCUS GROUP MEETING
WEB DEVELOPMENT SPECIALIST CERTIFICATE PROGRAM
TUESDAY, OCTOBER 7, 2008 6:00 P.M. TO 8:00 P.M.
H-1005

Present

Ray Allen, Director, Information Technology- Ellis Don Construction
Rob Allen, Supervisor, TGT Solutions Inc.
John Cole, Senior/Lead Developer, Medtech Wristbands
Jim Cooper, Coordinator, School of Information Technology, Fanshawe College
Martin Cserhati, CTO/Co-Founder, Dynamik Group
Tracey Gedies, Curriculum Consultant, Fanshawe College
Craig Green, Team Lead, ZTR Controls
Chris Janes, Sansys, Inc.
K. Chris Kirby, Manager of Technical Services/Canadian Language & Literacy Network, UWO
Bill Misener, Sansys, Inc.
Bill Pulling, Instructor, School of Information Technology, Fanshawe College
Otte Rosenkrantz, Curriculum Consultant, Fanshawe College
Kevin Weaver, Chair, School of Information Technology, Fanshawe College
Deb Wilkin, Manager, Curriculum Development, Fanshawe College
Marilyn Willis, Curriculum Consultant, Fanshawe College
Cathy Windel, School Assistant, School of Information Technology, Fanshawe College
Gord Worrall, Information Systems Services, Fanshawe College

Introduction and Purpose

Kevin Weaver thanked everyone for attending and he introduced himself and his position as the Chair for the School of Information Technology at Fanshawe College. Kevin explained to the group that the purpose of the meeting is to look at offering a new program and to expand the offerings at Fanshawe College as part of a strategic plan for new growth and new growth markets. Kevin briefly overviewed the Second Careers Initiative, mentioning that funding for post-secondary students is offered up to $28,000 and Kevin explained that this program has grown out of this initiative and that it may appeal to this audience but not exclusively. Kevin also mentioned that direct entry from high schools is on the decline and that the college is looking to create new opportunities for applicants. Kevin also commented that private colleges have continuous intakes and short duration programs compared to Fanshawe which only has two year programs with an intake model of fall and winter. Kevin explained to the group that

this program is intended to solve these problems. Kevin asked the group for feedback from the industry as well as the applicability for programs and the employability for graduates.

Brief Overview of Current Programs

Jim Cooper offered a suggested name for the program but he mentioned that this name is not cast in stone and he asked the group if they felt that there is a better name for the program. Jim also provided the group with a brief overview of a few of the programs in Information Technology. Jim explained that the Computer Programmer Analyst program is a three year program that provides a co-op and that it is strong academically with a focus on programming and some web material. Jim mentioned that the Business Information Systems program offers some web material but that the main focus is on application programming, java and C#. Jim mentioned that the Web Development Essentials program is a one year certificate with a lot of web material but that it also shares the first two semesters with the other programs. Jim mentioned that serious web development doesn't happen until the third semester and it is only four months in duration. Jim summarized by saying that currently the school is not strong in web development and that the program structure is conventional with four month terms and two entry points for students. Jim also mentioned that if students fail courses it is difficult for them to catch up because the program is schedule based. Jim indicated that another issue that occurs is not enough time to complete projects and he expressed concern that this sets the wrong example for Information Technology which is not time-based in the real world.

Jim Cooper outlined the proposed new program to the group and he mentioned that the target market for this program would be retraining (Second Careers), university Liberal Arts students and high school students. Jim expressed the concern that the college may end up competing with itself as other students from other programs at the college may decide to transfer to this program. Jim mentioned that the concept around the program is that short is better in terms of duration and he questioned the group regarding whether the duration of the program should be eight or ten months. Jim also mentioned that the maximum number of months for the program should be twenty-four months as the government will not fund the Second Careers students for more than two consecutive years.

Jim Cooper described the framework of the program, mentioning that it would include frequent intakes (every two months) with the first two months composed of a traditional delivery method involving skill sets and could be denoted as a "boot camp". The structure of the program would be project-based with completion of projects being done when they are done, but that they may have a target completion date. Jim mentioned that projects would need to be completed and that students may have to build a portfolio of a website as well as website projects.

Jim questioned the group regarding what sort of vocational content would be needed for this program as well as what would make a graduate employable in the market. Jim mentioned the importance of having a name for the program that will market well and represent the content of the program. Finally, he asked the group to consider the employability skills that would be necessary for this program and to also consider the length of the program.

Facilitation of proposed program requirements

Deb Wilkin introduced herself and the other curriculum consultants to the external group. Deb explained that the Ministry has learning outcomes based on entry level positions and she questioned the group regarding the skills and knowledge that graduates from this program would need and whether there is even a need for this type of graduate. Deb Wilkin reminded the group that there is flexibility with the name of the program as well as the content of the program.

Deb asked the group to write down on sticky notes what they thought would be either the skills or knowledge needed and specifically asked for feedback regarding the necessary math skills that a graduate should possess. Deb also asked the group to note any employability skills such as interpersonal skills and teamwork skills that would be helpful in this field as well as any legal issues that students should also know for the field.

The results of this task and the responses of the group are listed below according to category:

System Analysis and Design

- Understanding of software development life cycle
- Object oriented Design and development
- UML Entity /Process Modeling
- System Architecture and Design
- Design Patterns
- Use Case Analysis
- Agile Development
- Model Controller View Paradigm
- Need to understand purpose of application

Compatibility Issues

- Cross browser compatibility
- Inter-Operability between technology vendors

Interface Design Usability

- User- Interface Design
- Graphic Design principles
- Understanding of interfaces from end-user perspective
- Graphic design skills
- Usability
- Graphic Art Design- Intro course

Hardware/Server Configurations

- Hardware Systems knowledge
- Basic web server configuration
- HTTP- describe parts under hood, not tear engine apart
- Set up a basic website
- Understand basic network knowledge
- How internet works

Programming Skills

- Understanding Performance Implications
- Web Programming
- PMP, Python, Ruby
- Source Control Systems
- Tools- Dreamweaver (for Eyap6)
- Testing Strategies (Unit Testing)
- Supporting existing code base
- Mobile Support
- Importance of Testing and Debugging
- Testing Skills
- Frameworks Cake or Fusebox
- C# ASP.Net
- Integration of multiple languages and/or components
- Open source alternatives
- Open source web-based applications
- Non-dependence on specific programming tools

Soft Skills (Essential Employability Skills)

- Interpersonal Skills
- Active Listening Skills

- Problem Analysis Skills
- Research Skills
- Teamwork
- Presentation Skills
- Customer Relations
- Complaint Resolution Skills

Project Management

- See others' points of view
- Different approaches
- Presentations that are understandable
- Procedure/Development
- Documentation skills
- Formal Documentation
- Visualization Skills
- Decision-making capability
- Leadership
- Intermediate task management skills
- Self confidence
- Time management skills
- Time/Effort estimation
- Workflow management
- Consultant vs. Team member

Desirable Entry Knowledge

- Grade 12 Math

Database

- Database Design and Access
- Intermediate database normalization skills
- SQL
- Access Update related to SQL
- Fundamentals of Database (Tables)
- Construct a normalized database

Security

- Security Analysis
- Understanding security models
- Understanding basics (read and write Access)

Business Issues

- Understanding of business operations
- Understanding fundamentals of business process (Accounting and Marketing) and understanding how these applications relate to business
- Understanding functional areas and processes in business
- Marketing principles
- Ability to understand the business (what the task/project means to the business)
- Understanding of business issues
- Marketing and Entrepreneurial skills (if market is retraining then they may be more likely to go out on their own)
- Time and Schedule management
- Legal Issues
- Privacy NDA
- Customer retention
- Legal aspects of own business

The group continued to elaborate on the above criteria and offered additional comments:

Regarding *security*, it was mentioned that a graduate from the program would need to be able to understand various levels of access, starting at the database level to the interface level. It was also agreed upon that an entry level position would not require one to be able to analyze security. When questioned regarding what would be needed, it was commented that it would depend on the application as some already have security built into the applications. It was also mentioned that the graduate should also be able to understand security issues related to setting up a website.

Regarding the *business aspect* of the program, members of the group commented that it is important for the graduate to have an understanding of the fundamentals of business such as marketing and accounting and that one needs to know that they are developing an application with a purpose. The value of learning marketing and entrepreneurial skills was touched upon, mentioning that many students have expressed a desire to start their own businesses. From this, it was mentioned that it may be worthwhile to offer a course covering how to start a small

business. Deb Wilkin commented that it may be valuable for the program to offer core courses with various streams to meet the needs of students.

Relating to *soft skills*, the ability to communicate with both employers and clients was mentioned.

Regarding *project management*, visualizations skills were thought to be key as well as intermediate task skills and being able to manage larger and smaller tasks with target dates.

In the area of *interface design usability*, it was mentioned that a graphic design element to the program might be useful for learning both graphic layout and marketability. It was felt that from an entrepreneurial aspect this would allow one to be more independent and not need to rely on the skills of a graphic designer to complete a project. It was also remarked that often programmers do not have a balance of programming and design and that learning these skills would be beneficial to assist with design as well as sales and marketing. Deb Wilkin commented that there is a graphic design program at Fanshawe College.

With regard to *hardware server configurations*, group members commented that the skill level for graduates would need to include the basics regarding setting up a website in the realm of basic network and server knowledge. It was mentioned that the graduate would not need to know the hardware to set up a server but that one should be able to understand basic components such as http.

Regarding *system analysis and design*, it was mentioned from a member of the group that in the past, Fanshawe graduates have been very focused on Microsoft and it was felt that more recent graduates have more breadth in computer applications. It was mentioned that there is a need to be more versatile in the field without getting locked into one system. It was also mentioned that there are often issues with different browsers therefore it is important to learn basic skills. The importance of understanding the purpose of the application and the ability to see the "big picture" was raised as well.

Deb Wilkin revisited the issue concerning the need for grade 12 Math for the program and it was commented that the ability to abstract reason as well as logic were important factors in the field. It was also mentioned that the ability to understand the flow and process as opposed to specific mathematic skills are necessary. Deb Wilkin commented on the concern regarding not wanting to set up artificial barriers for applicants if a certain requirement is specified as needed. Deb mentioned the importance of wanting to remove as many barriers as possible for both high school students who may not have the required Math and mature students who have been in the workplace. Kevin Weaver mentioned that the statistics for the other programs that require Math are being reviewed and that the other programs in Information Technology require grade 12 Math. Kevin also commented that ministry standards for grade 12 Math is

broad spectrum and that often teachers will teach what they know or like. Kevin also noted that approximately half of the colleges require math but that a lot of colleges have removed the math requirement, especially in the web-based programs. Kevin expressed concern regarding adding grade 12 Math as a requirement to the program, mentioning that it may take a few years to remove this requirement if it is initially implemented. Kevin continued to mention that the IRP group is going to pull statistics and he mentioned that a lot of colleges currently require grade 11 Math with a minimum grade of 60 percent or 65 percent. Kevin commented that the biggest indicator is how students do in the math at the college and how they do throughout the program.

Regarding the duration of the program, Deb Wilkin asked the group if this type of graduate would be able to complete the program in 12 months. From this question, the co-op element was raised and it was agreed upon by the group that having a co-op component would be good. When questioned regarding the timeframe for the co-op, it was suggested that a four month term would be good and that the co-op should not occur until at least 8 months into the program. It was also suggested by another member that a co-op placement could occur after four months and then students could return for the remaining four months of the program after the completion of the co-op placement.

Kevin Weaver mentioned that the delivery of the program would not have to adhere to the semester model and that students may have the opportunity to achieve credit for online courses or work experience. Deb Wilkin continued to explain that Essential Employability Skills would be embedded into courses within the program. Kevin suggested that English or basic skills could be offered at the front of the program as a member had expressed concern regarding these skills being a possible barrier for applicants.

The group questioned whether or not a short program would hurt employability and Deb Wilkin responded that the key word is diploma and that students would still need to meet the required learning outcomes for the program.

Concerns were raised by the group regarding the self-paced aspect of the program and they mentioned that the program would need to have structure. Kevin Weaver replied that the college will have to have mechanisms and supports in place. Kevin outlined the structure of the program, explaining that there will be students who have almost completed the program that will be mentoring new students and Deb Wilkin added that students will still need to be evaluated. The group responded that having a structure that would involve project-based teams that the instructor would oversee might be valuable.

Deb Wilkin invited external members of the focus group to participate in various aspects of the implementation of the program and she asked the group to complete a questionnaire indicating their interest in future involvement with the program.

Wrap-up and Next Steps

Kevin Weaver thanked the group for participating in the focus group and explained that the next step is to take the feedback from the meeting and formalize it into a summary format. Kevin mentioned to the group that progression with the program will be seen and that feedback is appreciated. Kevin commented that the college is always interested in people helping with curriculum and teaching as well.

Meeting adjourned.

Business Information Systems (BIS5)
External Focus Group
Meeting Minutes

Present

Deb Wilkin - Centre for Academic Excellence
Kevin Weaver – SIT Chair
Jim Cooper – Program Coordinator
Sara-Jane Classen – Recording Secretary
Terry Scafe – TD Bank Financial Group
Gord Harrison – Info-Tech Research Group
John Hay – DRN Commerce
Al Thodt – City of London
Trevor Timbeck – Itinerant Software
Doug Hamilton – Iciniti Corporation
Mark Phipps – CoreSolutions Software Inc.
Nick Klisht – CitiCards North America

Call to Order and Introductions

Deb Wilkin called the external focus group meeting to order at 5:30 pm on April 6, 2010 in H1005 at Fanshawe College.

Overview

- Deb asked the group who has heard of the BIS program. Two people were familiar with it.
- Deb explained that it is a program that is struggling. The grad satisfaction rate has been dropping, the student enrolment rate is dropping and students are not getting jobs in a BIS field.
- BIS basically falls in between CPA (Computer Programmer Analyst – 3 year advanced diploma) and WDF (Internet Applications and Web Development Fundamentals – 1 year certificate).
- BIS has been suspended before in early 2000 but it was resurrected in 2006 and has been struggling every since.
- The main focus of this group will be, should we continue offering this program and if not, what should it morph into?

Program Overview

- Kevin asked who is familiar with CPA – everyone.
- There is a common first semester between all IT programs that so students can switch between them after the 1st semester.
- Apps as a trend have been falling for BIS. CPA apps are up and WDF holds its own
- BIS tends to pick up students from CPA as the semester goes on.
- There are harder programming courses in CPA so some students end up switching to BIS because it easier as far as programming goes.
- BIS has lost its identity. What do students expect? What do employers expect?
- An important thing to note is that the vocational learning outcomes for the BIS program have not been reviewed by MTCU since 1998.

Program Detail

- CPA is our flagship program. It is a co-op program. It is 3 years in length and the programming is harder, more advanced.
- BIS has some things that CPA doesn't like accounting and marketing. WDF has specialized web content that is also not a part of CPA.

- A lot of students will take levels 1 and 2 of CPA, take the 3rd semester of WDF, and then finish CPA in the following fall. Their reason for doing this is that they want the PHP content that is taught in 3rd semester WDF.
- Students rarely come into CPA from the BIS or WDF
- Jim goes over a chart that explains common semesters, content themes and comparative skill levels between the 3 programs.
- CPA gets really hard in the last 4 semesters.
- CPA is successful because it has a lot of depth and breadth, a lot of specialized skills. There is a lot of hard C++, Java, C# and Javascript.
- WDF is non-specialized because there is not a lot of depth. The 3rd semester has LAMP which seems to help student get entry level jobs.
- BIS is also non-specialized. They do C++ but the students question why and they struggle with it.

Job placement comparisons

- CPA students get hired to write code initially. C++ is not used as much but it shows skill level and generates respect. A lot are getting hired as a Business Analyst.
- WDF students are hired to do LAMP development.

Panel Discussion

- Nick - we used to have CMP (2 year computer programmer diploma) is that gone now?
    - Kevin - It was cancelled in 2004. Students weren't signing up for CMP. There was a lot of fall out from CPA but numbers were not enough to keep running
- Terry - you hit the nail on the head with depth. That's why they like to hire CPA graduates. Why would we look at BIS if there are all of these other programs with so much more depth?
    - Jim – exactly. The program does not have enough depth. It's a bit of technology and a bit of business.
- Terry - but what if they have MORE business. CPA is easier to map to jobs, but the analysis part is hard to match to programs.
- Gord H - I thought BIS was a business analyst program?
- Gord W - I wouldn't hire a business analyst straight out of school without actual business experience.
- Gord H - We hire them right out of Ivy League Schools
- Terry - I would take them at an entry level and pair them with a more experienced person

Deb - what if BIS was a graduate certificate program?

- Gord - that would make more sense. If you aren't willing to alter CPA then you should drop BIS and make it a grad certificate. OR alter CPA and make it a two year, then add in a grad certificate that is focused with either gaming or business analyst etc. And they should all have co-op because that makes hiring easier.
    - Kevin - any program that has been put out as Business Analyst or as Business Information Systems ends up getting cancelled. Students want either Business or IT but not both together.
- Al – I am a Fanshawe grad from 1981 in business data processing. It was a 2 year with optional 3rd year. As a student I liked the option of having a 3rd year or looking for a grad
- Terry – Fanshawe IT grad too, 1977
- Gord Worall – Fanshawe grad as well in BIS
- Nick – Fanshawe CPA grad

- Nick – there needs to be more options for students. You can lose students in the 3rd year with the direct gaming stuff that is very difficult and not practical for a workplace. A 3rd year to specialize in a stream would be good.
    - Deb – we also have to look at more flexible options like graduate certificates because students don't always have X amount of years to complete a diploma as opposed to a certificate.
    - Kevin – explains that CTY (Computer Systems Technology) has a streaming in the 3rd year. Students get to choose 4 of their courses, 2 per semester. It doesn't conflict with co-op and gives students options.
- Gord H – The stream option sounds less risky. What is the resistance to making a change?
    - Kevin – we don't know. We have a two part process, we don't want to bias the EFG but there is a downside to changing CPA and adding a grad certificate. If we stopped after 2 years and offered a grad certificate we couldn't offer a co-op – streaming would allow us to continue co-op.

Deb - Are there other niche markets out there that we could use BIS to satisfy?

- Al – there are lots of new technologies – Blackberry development would be good.
- Gord H– same with iPhone apps
- Trevor – I feel that people who want BIS don't have a programmer brain but they need a depth of some sort. All IT programs used to start out with Business. We don't need that business name anymore. Specializing in mobile development would be good. BIS tries to cover too much with too little time. So making a very specific skill like mobile, would be a good improvement to the program.
- Gord W - unless you change CPA then BIS should go. Someone at Fanshawe would be more successful becoming a Business Analyst if they came in as a programmer and then took grad certificates or specialized courses.
- Al – from an employer view, if they have a 1 year or 2 year diploma, they go to the bottom of the pile even though there are jobs for all of those fields. 3 year diplomas go to the top of the pile.
- Gord – co-op or work experience is necessary. Maybe BIS needs to be a 3 year with co-op.
- Terry – Definitely would still need more depth, even if it is 3 years.

Deb – what would you suggest be put in?

- Everyone – project management, requirement documents, QA processes - more analyst stuff.
    - Kevin – a 3rd year would give us more time for depth.

Jim- is there a need for a program that would focus on high level web development?

- Gord – if you are willing to change CPA then there are lots of things to consider. Right now there are gaming courses that are only valuable to a few. If students could choose their stream in CPA then they could pick gaming or whatever.
- Nick – The key is 3 year diploma from a hiring point of view. A lot of our Business Analysts are internal hires with a diploma and work experience

Deb – So there is a need for Business Analysts, more Web programming and mobile programming?

- Gord H– one of the ways we differ between a Business Analyst and a programmer is that the BA guy is not a programmer. We want him to have UML, be a master of EXCEL etc and be able to work WITH programmers.
- Trevor – some of those positions don't grow at school, they grow at work.
- Al – need something about client relationships, interviews, requirements, presentations etc. That is something that programmers don't have.
    - Kevin – guidance counsellors typically don't send extroverts to IT programs.
- Trevor – then maybe that program doesn't belong in IT. If they aren't programming then we need to weed them out. Don't give them something easier. Send them to business.
- Gord H – we don't want a problem solver in a BA, we want someone that finds the problems.

Deb – when do we lose students?

- Jim – we have a lot of C++ and that is where we lose them. The Argument for having C++ has been if they can program that they can program anything.
- Gord – what are your employers using? If they aren't using c++ then maybe it should be a specialized course if we went with the streaming option?
- Al – we use C# and Java
- Terry – C++
- Gord H– I like our developers to be able to use UML and understand it but they don't need to make the diagrams.
- Trevor – if they are struggling with programming they should go to web programming. It is still programming but not as difficult.
- Al – Do programmers switch to networking?
- Jim – they do but it's in the first semester. This semester 23 students switched from CTY to CPA after 1st semester. Typically technology students don't want anything to do with programming.
- Gord W – would have to market it differently to people who are already working in a company, but not to students out of high school.
- Gord H – right now BIS is producing a lightweight programmer which no one wants.
- Al – add more project management, client relationship management, risk management, using tools, project leadership, data analysis etc.
- Gord W– Can help the student get the PMP designation

Kevin – do you have a distinct need for someone from this program or would they be competing with CPA?

- Gord H –yes, there would be a distinction
- Terry – agrees – two distinct roles for sure.
- John H -what about an internship? I like the idea of having a student for 8 months
- Al – Agreed, 4 months gets them rolling, but 8 months would be better.
    - Kevin– co-op is governed so there are certain rules we have to fall into. We do have options for 8 month or 12 month.
    - Deb – one of the keys for co-op is that they need to come back to school for the last semester

- Gord – Fanshawe used to do 8 months. What stopped that?
    - Kevin –Employers said they didn't like it.

Overview of Suggestions

- CPA – streams in 3rd year
- BIS as a grad certificate
- BIS modified into a 3 year Systems Analyst program with the base of CPA
- **BIS as it is now is not viable**

Deb - Now we need to come up with program learning outcomes and curriculum development. We would like to call you back to discuss those program learning outcomes once they are done. Then we would have to do the approval process.

Kevin – we will send out minutes and a summary of the recommendations. Everyone can give feedback on that as well. It will be an evolution over time. Thank you for coming.

Meeting adjourned at 8:00 pm.

Why Web Developers Are In High Demand and Windows Developers Are Not

Part 1 of 13 in the Series: How To Learn Programming Languages

One of my computer programming coaching clients inquired about the difference between web developer careers and windows developer careers, their different tracks of study and which has a higher demand at this time.

And my response is:

> **Windows developers** create applications known as thick clients that reside on the desktop, while **web developers** create applications known as thin clients that are viewed through a web browser (Firefox, Internet Explorer, Opera, etc.).

1. Aspiring windows developers have to learn windows application development using tools like Visual Basic, C#, C/C++. Beginning web developers have to learn web application development using tools like Visual Basic, C#, PHP, ASP.NET. Beginning web developers also have to learn browser based technologies including CSS, JavaScript and HTML.

Web developers are in much higher demand at this time because the demand for web applications is much higher than the demand for windows applications. This is because web applications have the advantage of being accessible over the internet to anyone who wants to use it. For every ten web developer jobs advertised, I see about one windows developer job.

The curriculum of study for aspiring web developers is fundamentally different from the curriculum of study for windows developers.The study guide for a web developer career is described in my new e -Book ?How To Learn Programming Fast: From Beginner To Professional Computer Programmer?, which will be released today (Sunday, November 5, 2006).

This e-Book discusses:

1. Which programming languages you need to learn to become a computer programmer.
2. How to choose a programming language that best is best for you.
3. How to quickly master computer programming languages and technologies.
4. How to accelerate your career from beginner or novice to professional or expert computer programmer.
5. Complete study guides and career action plans designed for beginner programmers, junior, intermediate and professional or expert programmers. This study guide also includes the career path for aspiring web developers.

The demand 10 years ago was for windows applications because businesses were still getting used to the INTERNET and the WEB. Today there is a much higher demand for web applications. The web HAS CHANGED the nature of how we do business and how we interact with each other.

Web applications are in demand because they are easier to scale than windows applications. They are more cost effective to support, easier to deploy and vastly more accessible to humans and computers.Because of this, make sure that most of your programming projects are web applications and not windows applications. The skills you gain as a web developer will be in high demand across a wider market than the skills you gain from Windows development.

If a large portfolio of your application development is in Windows, your career may end up with skills that are not marketable and **you can become extinct like the Dodo.**

To learn more about fast tracking your computer programmer career, visit this resource.

Stay Current

Features

The 10 Most Sought-After IT Skills

What you need to know to get the best jobs — and the big bucks.

David Hakala

Despite continued outsourcing of IT jobs to overseas contractors, the market for talented IT professionals is still growing. The key to getting hired is having the skills that are in demand. Based on input from recruiters, analysts, CIOs and other hiring experts, here are the top 10 skills that IT professionals should cultivate for the years to come.

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1. Microsoft .NET Development: As companies push more applications to the Web, Microsoft's .NET is becoming a critical platform and development skill. In fact, programmers skilled in Microsoft .NET can command a 10 percent premium over those who lack it. Expertise in .NET can be useful to Web developers and designers, as well as to software engineers and developers.

2. Microsoft SQL Server Development: Behind every good Web site is a database, and SQL Server is the database platform of choice for many companies. Companies need programmers who can write code, including stored procedures, database scripts and triggers. Often, SQL Server skills are helpful to database administrators, application architects and application developers.

3. Windows Administration: If you have expertise in Windows 2003 or Windows XP, you're in demand. Active Directory experience is even better. Windows administration is the technical skill most in demand among IT departments, and it is especially valuable for system administrators, desktop-support analysts and help-desk personnel.

4. Network Administration: Experience with Cisco Systems Inc. products is especially sought after. The ability to maintain, troubleshoot and optimize routers, hubs and switches is the ticket to a career in network administration, systems administration and network engineering. Network-security certification is a big plus.

5. Wireless-Network Management: As 802.1X networks and wireless devices — such as tablet PCs, portable email gadgets and smartphones — have become more prevalent, so has the need for professionals adept at managing them. More than half of IT managers report that wireless expertise is among their most sought-after skills.

6. SAP Skills: The continuing growth of ERP (Enterprise Resource Planning) projects keeps SAP experts in demand. The field has a shortage of highly qualified contractors due to the complexity of the subject matter. In 2007, SAP contractors saw the highest rate of salary growth among all primary IT skill sets.

7. Web-Development Skills: As more corporate applications are migrated to the Web, demand for programmers who can make the conversions is increasing. Among the programming skills

al Basic.NET; Flash and ActionScript; general programming language praised iage Ruby on Rails, a Web-

8. Web 2.0 Application Development: Social networks such as MySpace.com and Facebook are releasing APIs (application programming interfaces) that enable third parties to develop applications that take advantage of the networks' underlying functionalities. As more companies embrace Web 2.0 tools, demand for programmers with this expertise will increase.

9. Project Management: Some of the best jobs do not rely primarily on technical skills. CIOs are looking for people who have guided complex projects from the conceptual stage through completion. This field also includes quality-assurance personnel who test components of a new system before it is rolled out.

10. Help Desk/Technical Support: As companies expand their applications portfolios, more and more trained support personnel will be needed. The complexity and customization of these applications means that much of that support will be in-house, not outsourced overseas. For multinational companies, multilingual support personnel will be in special demand.

IT professionals with the aforementioned skills can expect to find more job offers and, in some cases, significantly higher salary offerings than those who lack these skills. As enrollment in computer-science programs declines and baby boomers start to retire, there is a growing shortage of highly skilled workers.

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Six hot tech skills in 2010 to get you the job you want

For IT professionals either looking to get back into the workforce or mulling moves to greener pastures, here are the six types of skills most in demand.
1/4/2010 5:00:00 AM
by Mary Brandel

Pent-up demand for new projects. Veteran employees leaving the company. Who could complain about such pressures in the waning months of 2009, when the year was spent under a cloud of economic misery?

Certainly not Shane Kilgore, IT director at Randall-Reilly Publishing Co. in Tuscaloosa, Ala.

He was dismayed to see two talented software developers give notice recently. One had five years under his belt and the other had 10, but Kilgore took their departures as a sign that the economy is taking its first steps toward recovery.

He plans to hire a few new developers this year, not only to replace the ones who left, but also to work on new products that will be in demand when -- as many economists predict -- the recovery gains headwind this year.

"Things have been frozen because of the economy," Kilgore says. "But if we don't get new products out there, we won't have enough places for customers to put their money."

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Still, with signs pointing to recovery and even job growth in 2010, companies such as Randall-Reilly are planning to hire only in key areas, and even then, they will favor people with skills that span multiple disciplines.

In many cases, companies will still resist bringing on full-time employees, says Tom Silver, senior vice president for North America at Dice Holdings Inc., which operates Dice.com and other careers Web sites. "One thing we see companies do is bring people in on a project basis, and then as business comes back, they hire them full time," Silver says.

According to *Computerworld*'s 2010 Forecast survey, this year's hiring plans certainly aren't at 2009 levels. Less than 20 per cent of the 312 IT executives polled said they plan to increase IT head count in the next 12 months, compared with 26 per cent in the previous year. And nearly 20 per cent said they plan to decrease their IT head count.

For IT professionals who are either looking to get back into the workforce or mulling moves to greener pastures, here are the six types of skills most in demand among survey respondents who said they expect to hire IT workers in 2010.

1. Programming/Application Development

Among companies that plan to hire, the top reason for doing so is to meet demand for new systems and projects. That could be why programming /application development is the skill set that's most in demand, by far, according to Computerworld's survey.

"We're actually seeing new projects get the green light," says Dave Willmer, executive director of IT staffing firm Robert Half Technology. Quite possibly, he says, these were projects that were canceled at the end of 2008, only to be revived for 2010. The wave of new projects is also leading to demand for application developers who can double as business analysts and project managers, Willmer says.

Specifically, companies will look for developers with knowledge of .Net, Java, Web development, open source and portal technologies such as Microsoft Corp.'s Sharepoint, says Willmer, who is a Computerworld columnist.

Demand is growing for people who know specialized programming languages like Ruby on Rails and AJAX, Silver notes. There aren't many jobs that require those skills, he says, but the number of openings has increased since January 2009.

Kilgore says he would like to find a "hybrid" software developer who can also serve as a business analyst. "We need someone who can talk to the business and be a requirements gatherer, project manager and software developer, all rolled into one," he says. He also needs developers with open-source expertise -- a rare talent, he says -- as well as professionals familiar with Microsoft tools for the ERP and marketing intelligence sides of the business.

Willmer says it makes sense that companies are looking for developers with skills in other areas, such as business analysis or even quality assurance, since employers are concerned about the cost of talent. "They're making sure they get the most out of their resources," he says.

Computerworld's Forecast survey respondents said they also need developers to build homegrown applications in an effort to save money. That's the case for James Sullivan, manager of information services at Covidien, a global health-care company in Mansfield, Mass.

Sullivan soon hopes to add three or four business-savvy programmer/analysts with Java or .Net backgrounds and an understanding of SQL databases. That represents a 25 per cent increase in his usual hiring levels, he says, and it's a departure from previous years when he looked for programming skills alone.

One of Covidien's 2010 projects is to migrate from third-party custom-built applications to commercial off-the-shelf applications or bring them in-house. This, Sullivan says, would reduce spending on vendors and consultants, as well as enable his group to provide the support and turn around business-driven changes more quickly. This dovetails with a growing trend at Covidien to better leverage existing resources. "If something takes 10 hours today, we're asking how we can make it take one-tenth of that," Sullivan says.

At Scottrade Inc., the recession didn't affect hiring, according to Ian Patterson, CIO at the online financial services company. He hired more than 150 IT professionals in 2009 and plans to hire up to 200 this year to meet demand for new internal and customer-facing applications, and to keep up with changes and expansions. He says he's mainly looking for people with C++, Java and C# skills and notes that the company is also implementing a Siebel CRM system for the call center.

Energy Northwest, a power supplier in Richland, Wash., also saw continued growth in 2009. CIO Keith Cooke is looking for computer and electrical engineers with Java, Web and .Net skills to help fully Web-enable an internal system that is partially Web-based but still uses a terminal-based interface. Initially, he didn't want to retrain staff to use a browser-based interface. Now, however, "we're bringing on people who can help us adapt our legacy system to the new workforces coming in," Cooke says.

2. Help Desk/Technical Support

It's no surprise that there will be strong demand for the people who make the help desk hum in 2010, Silver says. The need for support technicians tends to reflect general business conditions, he says. "As the business starts to improve, companies hire more people, which increases demand for help desk staff," Silver explains.

Willmer says he's already seeing a rise in demand for help desk and support skills, especially among companies that cut too deeply in this area in 2009. "They can get away with it for a certain time period, but it eventually catches

up and affects revenue," he says. Instead of offering full-time positions, however, some companies are hiring on a project basis, he adds.

3. Networking

The demand for networking professionals, Willmer says, is likely connected to the growing complexity of networks and to the stresses placed on them by virtualization and newly popular approaches to application delivery, such as cloud computing and software as a service.

Cooke says the network will be a big area of focus in the coming year. Energy Northwest is making increasing use of video and voice over its IP network, so it will need network, voice and radio engineers to handle upgrades and ensure compliance with new federal mandates. One of those mandates requires the company to move from wideband to narrowband radio frequencies.

Patterson sees Scottrade dabbling with a converged infrastructure in the next 12 months, driving a need for people with a mix of server, software and networking skills to support networked storage and server devices contained in a single chassis. "This will change the market for the type of people we need," he says. "It won't be just a guy who knows EMC and Hitachi storage, but [one] who knows server, storage and networking all in one device. We'll need a guy who says, 'The network has a problem here,' but when he traces it down, the problem is due to a lock on a table in the storage device."

4. Project Management

Silver sees project management as an area that is growing in importance and a good avenue for technology professionals interested in building up their careers. "Professionals who understand technology and how it fits in the overall business strategy are the ones who add the most value, get paid more and have the most fulfilling careers," he says.

5. Security

Willmer sees a relationship between demand for security skills and the still-shaky economy. "The biggest threat to companies is breaches by their own staff," he says. "When you throw in changes to the staff and disgruntled employees losing their benefits or facing the threat of being laid off, you increase the chances of network fraud or security infringement."

Meanwhile, Cooke is concentrating on hiring people with cybersecurity skills. "Ten years ago, we didn't worry -- as leaders in our companies -- about things like passwords," he says. "Now we're making sure we support complex passwords. That's just a new reality."

Energy Northwest is looking for recent graduates who studied computer engineering and digital controls to help upgrade its manufacturing systems from analog to digital. "They need to understand how those systems should be protected, given the security world we're operating in," Cooke says, citing new federal regulations and threat warnings emanating from the Department of Homeland Security.

Patterson thinks the trend toward including security features in network and storage devices will also affect the skills professionals need in this realm. "I can't believe in the long term that you won't see companies like EMC or Cisco not embedding security into their devices," he says. "We're going to need people who understand not just how to run things from a server or storage or network perspective, but also the security implications."

Security is an evergreen skill, according to Silver. "If you know how to help keep your company's information secure, there will be a home for you forever," he says.

6. Business Intelligence

For Kilgore, BI is a high priority skill. "Being a smaller midsize organization, we're late to the game in BI," he says. "We don't have the budget to do a year's worth of R&D; we have to be effective with it out of the gate."

Sullivan would like to find a data architect to help with Covidien's conversion from a nonstandard business intelligence system and miscellaneous reporting tools to an enterprise standard. More important than a BI expert,

though, are programmers/analysts who can relate the nitty-gritty of data tables, database joins and data structure to business requirements. "That's what I'm finding is more valuable to us at this stage in getting BI established and used by the business," Sullivan says.

Meanwhile, at Scottrade, Patterson sees BI intertwined with Web 2.0. Whereas BI has traditionally been understood as a system that collects historical data and provides tools to analyze it, he says, he's now more interested in real-time BI that relies, for instance, on people entering competitive data into a wiki and providing that information almost instantaneously via a portal.

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Top 10 Skills in Demand in 2010

By Linda Leung

In the Global Knowledge/TechRepublic 2010 Salary Survey, conducted at that end of last year, one of the questions put to respondents was "What skill set will your company be looking to add in 2010?" The skills listed by respondents include the perennial favorites: security, network administration, and Windows administration. Also included are virtualization/cloud computing and Web development. Meanwhile, an old favorite, business analysis, makes a come back. Here's the complete list, with the No. 1 skill listed being in the highest demand.

1. PROJECT MANAGEMENT:
As we emerge from the recession, organizations aren't likely to go back to the go-go days of throwing money at IT initiatives or taking risks and deploying without careful thought and planning. Organizations are putting pressure on IT to only implement projects that can show real return-on-investment. The first step to achieving a good ROI is professional project planning and implementation.

Project management skills often appear in top 10 skills lists, perhaps because some organizations got their fingers burned in the 1990s through the poor implementation of IT projects such as enterprise resource planning initiatives. But even though the profession is mature (in IT terms), project managers still have work to do to advance their status within organizations. According to an article on the Project Management Institute Web site, project managers still have to develop their people skills, organizational leadership, and individual professionalism.

2. SECURITY:
It's a never-ending game of cat and mouse for security professionals and 2009 proved to be another fun filled year. According to Symantec's Security and Storage Trends to Watch report, the number of spam messages containing malware increased nine-fold to represent more than 2% of e-mails, while other criminals manipulated people's love of social networking sites to launch attacks. Twitter, for example, spent much of 2009 battling DDoS and other attacks. Meanwhile, top headlines, such as the H1N1 flu and the death of Michael Jackson were used by criminals to lure people to download malware.

Symantec predicts more of the same in 2010, warning that attackers will continue to use social engineering to get to consumers' sensitive data, and criminals will take Windows 7 as a challenge for seeking and exploiting vulnerabilities in the new platform. Mac and smartphones will also be targeted more by malware authors, Symantec says.

Despite the economic challenges of '09, organizations continued to hire security pros. The most sought-after security skills were information risk management, operations security, certification and accreditation, security management practices, and security architecture and models, according to a survey last year of 1,500 U.S.-based security pros by security certification provider ISC2. 2010 is expected to be another busy year from security professionals.

3. NETWORK ADMINISTRATION:
Networking administration skills never lose their luster. It's the second most sought after skill in the Global Knowledge survey and it will be the top skill sought by CIOs in the first quarter of 2010, according to a survey of IT chiefs by Robert Half Technology. In 2010, organizations are expected to upgrade to Windows Server 2008 R2 and the Windows 7 client, and perhaps install Exchange Server 2010 and SharePoint 2010. Enterprises are going to need network administrators to ensure network traffic continues to move without a hitch.

Meanwhile, Cisco hopes to push more data-intensive traffic onto corporate networks. Video is a key focus for Cisco in 2010 as it works to finalize its control of video conferencing maker Tandberg and through its 2009 purchase of Pure Digital, developer of the Flip video camera. At the end of last year, Cisco introduced two TelePresence certifications: the Cisco TelePresence Solutions Specialist for midcareer voice or networking engineers seeking to specialize in the planning, design and implementation of Cisco TelePresence; and TelePresence Installation Specialist aimed at installation technicians.

4. VIRTUALIZATION - CLOUD:
The projected cost savings and efficiencies are no-brainers for organizations seeking to implement virtualization and cloud computing. With the cloud computing space now taking shape it's difficult for enterprises to find pros with substantial relevant experience. Instead companies are drawing expertise from a range of IT skill sets, including storage, networks and desktop, according to a Network World article. Initially companies will set up cross-functional teams to buy and implement virtualization, but eventually cloud computing will be an expected skill set of systems administrators. In a few years, it could even be a standard skill set of all IT pros because it touches different aspects of IT.

For details about virtualization certifications from leading virtualization software vendors VMware, Citrix and Microsoft, see Global Knowledge's Top IT Certifications in Demand Today newsletter of June 2009.

5. BUSINESS ANALYSIS:
Business analysis roles were commonplace in many organizations in the 1990s when big projects, such as enterprise resource planning initiatives, required the critical thinking that business analysts could provide. But as businesses began moving at a faster pace, business analysis fell by the wayside. Factors such as the economic downturn and regulatory compliance have forced companies to take a step back and to think through business problems and their solutions, and business analysis is making a comeback, as a result. Kathleen Barret, president of the International Institute of Business Analysis says the discipline is a phoenix rising.

The IIBA describes the job of a BA as a "liaison among stakeholders in order to elicit, analyze, communicate, and validate requirements for changes to business processes, policies, and information systems." IT pros are good candidates for BA jobs because they have a broad perspective of a company's business, says Barret. There are three types of BAs: enterprise BAs who identify opportunities for business change and defines the work to be done; transition BAs who fine-

tunes the plans; and project BAs who work on project teams that implement the changes. Annual salaries average around $75,000 with enterprise and transition analysts earning more, Barret says.

For more about business analysis, see the IIBA's Guide to the Business Analysis Body of Knowledge.

6. BUSINESS PROCESS IMPROVEMENT:
With project management and business analysis skills appearing in this skills list, it's no surprise that business process improvement skill is also here. Business process improvement and business analysis go hand-in-hand. Business analysts identify areas for improvements to business processes, while business process improvement or management pros use BPM techniques and technologies to help companies optimize their business processes.

A recent BPM survey by IT researchers, the Aberdeen Group says the top reasons business are driving BPM activity are the need to reduce operating costs and to improve cash flow. However, the top barrier to adoption was the lack of knowledge about BPM. According to Gartner, among the competencies required for successful BPM initiatives include process skills, tools and process assets, and transformation skills.

To learn more about BPM, go to the Web site of the Business Process Management Initiative (BPMI.org), which promotes the standardization of common business processes; and the BPMinstitute.org, which describes itself as a peer-to-peer exchange for business process management professionals.

7. WEB DEVELOPMENT:
If you are -- or you know friends who are -- addicted to the FarmVille game on Facebook you'll know the power of Web development. In just a few short months, FarmVille's popularity has spread across the globe as Facebook fans tend to their farms and purchase virtual goods. The game, including others by FarmVille developer Zynga, has netted the start-up more than 200 million monthly unique users for its online apps. One financial analyst reckons Zynga could be valued at $1 billion if it were to go IPO in mid-2010.

Developing Facebook games is just one extreme of the vast Web development spectrum. Building iPhone apps could also be very profitable, writes Web developer and blogger Glen Stansberry. As moderator of the Freelance Switch job board, Stansberry listed other popular Web development skills including Framework knowledge, widget development, content management system customizations (for small businesses looking to create a unique look to their standard Wordpress and Drupal blogs), and Javascript Plugin creation.

8. DATABASE MANAGEMENT:
Databases are the hearts of key business systems that drive payroll, manufacturing, sales, transaction processing, and more. Programmers must be able to build programs that quickly and efficiently interface with the database management system (DBMS), while database administrators "must be able to bring the full power of database features to bear on business problems", writes Oracle- and IBM-certified DBA Howard Fosdick in his whitepaper Database Skills Availability: Critical to Your Selection of Database. "DBA expertise can be the Achilles' heel of database projects - many IT projects have failed due to the inability to secure DBA talent or successfully address DBA issues," he adds.

The major database vendors are Oracle, IBM and Sybase. Oracle runs three main certification programs for database professionals. Oracle Certified Associate is the first rung of the Oracle certification ladder. Next is the flagship Oracle Certified Professional (OCP) credential, which certifies an individual's ability to manage, develop, or implement enterprise -wide databases and other software. Oracle Certified Master (OCM) is Oracle most advanced accreditation. IBM offers a dizzying array of certifications surrounding its DB2 product series. The main credentials are IBM Certified Database Associate, Database Administrator, Application Developer, and Advanced Database Administrator. Sybase has two sets of certifications for its Adaptive Server Enterprise product: ASE Administrator Associate and ASE Administrator Professional; and ASE Developer Associate and ASE Developer Professional.

9. WINDOWS ADMINISTRATION:
As previously mentioned, Microsoft shops are expected in 2010 to upgrade to Windows Server 2008 R2 and the Windows 7 client, and perhaps install Exchange Server 2010 and SharePoint 2010 as well. Windows administration skills is going to be key for many enterprises implementing and maintaining existing and upgraded systems.

Microsoft Windows Server 2008 certifications at the MCTS level cover configurations for Active Directory, networking, and applications. Certifications available for the MCITP level are Server 2008 Server Administration, Enterprise Administration. In a November blog posting in Microsoft's Born to Learn blog, the company wrote that the first of its Windows Server 2008 virtualization exams would be entering beta soon. The exams will cover server virtualization, desktop virtualization, and virtualization administration. Windows 7 pros can certify as MCTS: Windows 7 - Configuration, and MCITP: Enterprise Desktop Administrator 7.

10. DESKTOP SUPPORT:
Our recent article "Top Certifications in Demand Today" listed desktop support as a hot skill. In Global Knowledge's 2010 salary survey, it was named as the 10th most sought-after skill this year. In the June article, we quoted Robert Half Technology Executive Director Dave Willmer as saying that businesses will need desktop support personnel to support new workers as organizations begin hiring as the economy improves. The introduction of Microsoft Windows 7 is also expected to generate additional interest.

Microsoft currently provides the MCITP: Consumer Support Technician, and MCITP: Enterprise Support Technician certifications, but they are based on Windows Vista. Microsoft, in its Born to Learn blog, in November said that it is working on a MCITP: Windows 7, Enterprise Desktop Support Technican certification. Prospective candidates are advised to prepare for 680: Win 7, Configuring and 685: Win 7, EDST.

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IT Staffing - Jobs Report Shows Android, iPad Skills in Demand
By David Needle
February 18, 2010

That didn't take long. Apple (NASDAQ: AAPL) has yet to ship its much-hyped iPad tablet, but Elance has reported there's already demand for iPad application developers ahead of next month's launch.

The iPad rode of a broader wave of demand for mobile tech skills at the online contract services site. While Web development continues to top Elance's list of most sought-after skills, the company said demand for mobile developers "exploded" in 2009, with a 180 percent increase for the past year.

As to the iPad specifically, Elance said 20 application-development jobs posted at the site immediately followed Apple's unveiling, and, as of this week, there are 70 open iPad-related positions at the site. Last year more than 8,800 iPhone-specific jobs were filled through Elance, the company said.

But the fastest growing demand for mobile skills belongs to Android, which has increased 400 percent in the past six months, including 170 projects in the last month.

The boom for mobile developers comes as the overall U.S. economy continues to struggle with double-digit unemployment rates. At the same time, companies needing work on specific projects can tap services like Elance, oDesk and Guru.com to get online contract and freelance help without hiring full-time staff.

"As we move forward in 2010, more people will make the online workplace their new office and will log in to get to work," Ellen Pack, vice president of marketing at Elance, said in a statement. "Three trends have come together to make this possible. Companies continue to look for greater flexibility and efficiency, more skilled professionals are choosing to work independently, and managing online work has become easier than ever due to sophisticated Web applications, mobile devices and cloud-computing platforms. This year, in particular, we will begin to see an interesting shift from small businesses to larger enterprises accelerating their use of online talent."

The Elance Online Talent report offered a glimpse into a couple of other noteworthy trends. For instance, the top five IT skills in demand at the site are: PHP, HTML, MySQL, CSS 5 and WordPress. Under the "creative" category, article writing tops the list, followed by graphic design, content writing, Photoshop and Illustrator.

Search engine optimization topped the list for marketing skills, followed by Internet marketing, lead generation, and sales, with advertising checking in at No. 5. Social media marketing, in the No. 7 spot, showed a 46 percent increase in earnings for 2009.

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TechRepublic : A ZDNet Tech Community

10 skills developers will need in the next five years

Date: April 1st, 2009
Author: Justin James
Category: 10 things, Career, Programming and development
Tags:

If you're a developer looking to get ahead in your field (or in some cases, to simply stay employed), this is not a good time to be complacent. Justin James lists the skills you'll want to work on now to maximize your future job prospects.

With the recent changes in the economy, a lot of developers are focused on their short-term job prospects. At the same time, it's important to make sure that you get the most bang for your buck when it comes to taking the time and energy to learn new skills. Here is our list of 10 skills you should be learning right now to make sure that your resume is relevant for the next five years. The list is hardly exhaustive, and there are huge swaths of the industry it won't cover (mainframe developers, for example). Nonetheless, for average mainstream development, you can't go wrong learning at least seven of these skills — not only to the point where you can talk convincingly about them at a job interview, but actually use them on the job.

Note: This article is also available as a PDF download.

1: One of the "Big Three" (.NET, Java, PHP)

Unless there is a radical shift in the development world (akin to an asteroid hitting Redmond), most developers will need to know at least one of the Big Three development systems — .NET (VB.NET or C#), Java, or PHP — for the near future. It's not enough to know the core languages, either. As projects encompass more and more disparate functionality, you'll need to know the associated frameworks and libraries more deeply.

2: Rich Internet Applications (RIAs)

Love it or hate it, in the last few years, Flash is suddenly being used for more than just animations of politicians singing goofy songs. Flash has also sprouted additional functionality in the form or Flex and AIR. Flash's competitors, such as JavaFx and Silverlight, are also upping the ante on features and performance. To make things even more complicated, HTML 5 is incorporating all sorts of RIA functionality, including database connectivity, and putting the formal W3C stamp on AJAX. In the near future, being an RIA pro will be a key resume differentiator.

3: Web development

Web development is not going away anytime soon. Many developers have been content to lay back and ignore the Web or to just stick to "the basics" their framework provides them with. But companies have been demanding more and more who really know how to work with the underlying technology at a "hand code" level. So bone up on JavaScript, CSS, and HTML to succeed over the next five years.

4: Web services

REST or SOAP? JSON or XML? While the choices and the answers depend on the project, it's getting increasingly difficult to be a developer (even one not writing Web applications) without consuming or creating a Web service. Even areas that used to be ODBC, COM, or RPC domains are now being transitioned to Web services of some variety. Developers who can't work with Web services will find themselves relegated to legacy and maintenance roles.

5: Soft skills

One trend that has been going for quite some time is the increasing visibility of IT within and outside the enterprise. Developers are being brought into more and more non-development meetings and processes to provide feedback. For example, the CFO can't change the accounting rules without working with IT to update the systems. And an operations manager can't change a call center process without IT updating the CRM workflow. Likewise, customers often need to work directly with the development teams to make sure that their needs are met. Will every developer need to go to Toastmasters or study *How to Win Friends and Influence People*? No. But the developers who do will be much more valuable to their employers — and highly sought after in the job market.

6: One dynamic and/or functional programming language

Languages like Ruby, Python, F#, and Groovy still aren't quite mainstream – but the ideas in them are. For example, the LINQ system in Microsoft's .NET is a direct descendent of functional programming techniques. Both Ruby and Python are becoming hot in some sectors, thanks to the Rails framework and Silverlight, respectively. Learning one of these languages won't just improve your resume, though; it will expand your horizons. Every top-flight developer I've met recommends learning at least one dynamic or functional programming language to learn new ways of thinking, and from personal experience, I can tell you that it works.

7: Agile methodologies

When Agile first hit mainstream awareness, I was a skeptic, along with many other folks I know. It seemed to be some sort of knee-jerk reaction to tradition, throwing away the controls and standards in favor of anarchy. But as time went on, the ideas behind Agile became both better defined and better expressed. Many shops are either adopting Agile or running proof-of-concept experiments with Agile. While Agile is not the ultimate panacea for project failure, it does indeed have a place on many projects. Developers with a proven track record of understanding and succeeding in Agile environments will be in increasingly high demand over the next few years.

8: Domain knowledge

Hand-in-hand with Agile methodologies, development teams are increasingly being viewed as partners in the definition of projects. This means that developers who understand the problem domain are able to contribute to the project in a highly visible, valuable way. With Agile, a developer who can say, "From here, we can also add this functionality fairly easily, and it will get us a lot of value," or "Gee, that requirement really doesn't match the usage patterns our logs show" will excel. As much as many developers resist the idea of having to know anything about the problem domain at all, it is undeniable that increasing numbers of organizations prefer (if not require) developers to at least understand the basics.

9: Development "hygiene"

A few years ago, many (if not most) shops did not have access to bug tracking systems, version control, and other such tools; it was just the developers and their IDE of choice. But thanks to the development of new, integrated stacks, like the Microsoft Visual Studio Team System, and the explosion in availability of high quality, open source environments, organizations without these tools are becoming much less common. Developers must know more than just how to check code in and out of source control or how to use the VM system to build test environments. They need to have a rigorous habit of hygiene in place to make sure that they are properly coordinating with their teams. "Code cowboys" who store everything on a personal USB drive, don't document which changes correspond to which task item, and so on, are unwelcome in more traditional shops and even more unwelcome in Agile environments, which rely on a tight coordination between team members to operate.

10: Mobile development

The late 1990s saw Web development rise to mainstream acceptance and then begin to marginalize traditional desktop applications in many areas. In 2008, mobile development left the launch pad, and over the next five years, it will become increasingly important. There are, of course, different approaches to mobile development: Web applications designed to work on mobile devices, RIAs aimed at that market, and applications that run directly on the devices. Regardless of which of these paths you choose, adding mobile development to your skill set will ensure that you are in demand for the future.

NYC CTO

IVAN KEDRIN – NYC CTO, WEB TECHNOLOGIST AND ONLINE OPERATIONS ROCKSTAR.

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Web Application Development Technology Demand Trends & Predictions

By nyccto

NOTE: This post focuses on web application development. All references, comparisons and predictions as they relate to software development technology / languages are strictly expressed in regard to web application development (not general purpose software development).

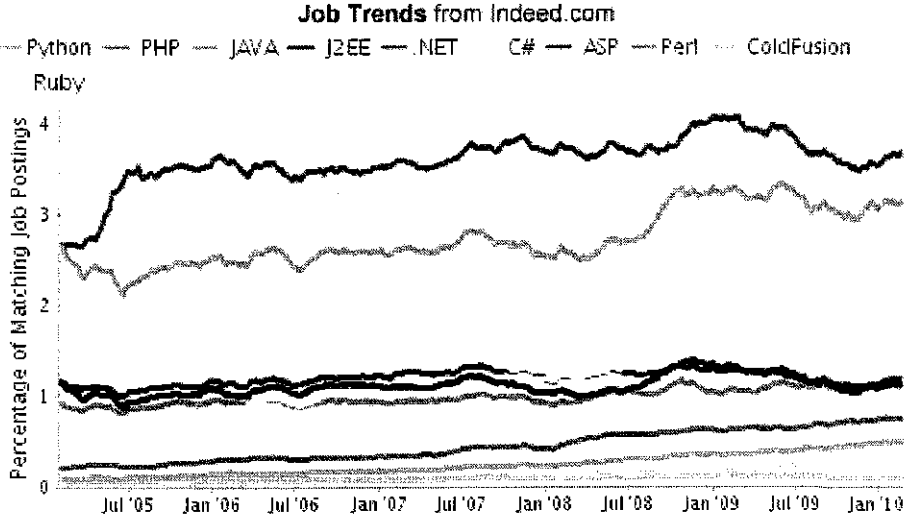
Job demand levels are generally a good indicator for how popular one technology stack is compared to others. The following is a quick analysis of web application technology demand trends for the past five years (Jan 2005 – Jan 2010). The data is based on millions of job postings/openings aggregated and tracked by indeed.com.

Web Application Development Technologies/Platforms

I've selected Python, PHP, JAVA, J2EE, .NET, C#, ASP, Ruby, Perl, and ColdFusion. This should provide a good representation of all major web application development technologies. Some of these categories are broader than others and may contain subcategories e.g. J2EE is JAVA, and C# is part of .NET, etc.

Demand Trends in Absolute Terms

First, let's look over the volume of job postings as an absolute percentage of all job openings.



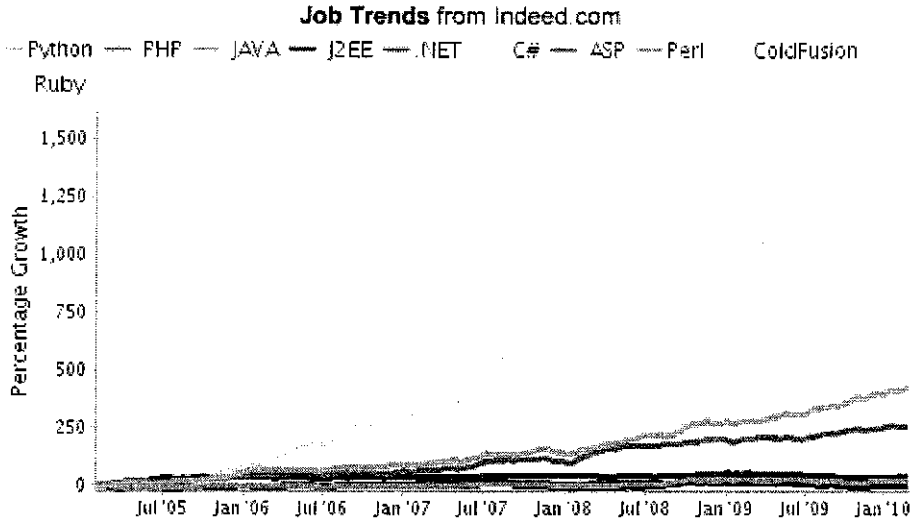
Not surprisingly, .NET and JAVA are the most sought after general software development technology stacks. .NET currently represents about 3.5% of all job openings, while JAVA is around 3% of all job openings. These numbers are

inflated by non-web application development jobs. The respective percentages that represent web application development done using both platforms should be significantly lower e.g. I wouldn't be surprised if less than 40% of total JAVA and .NET development were web application development related, while the rest would fall into the client/server/other categories.

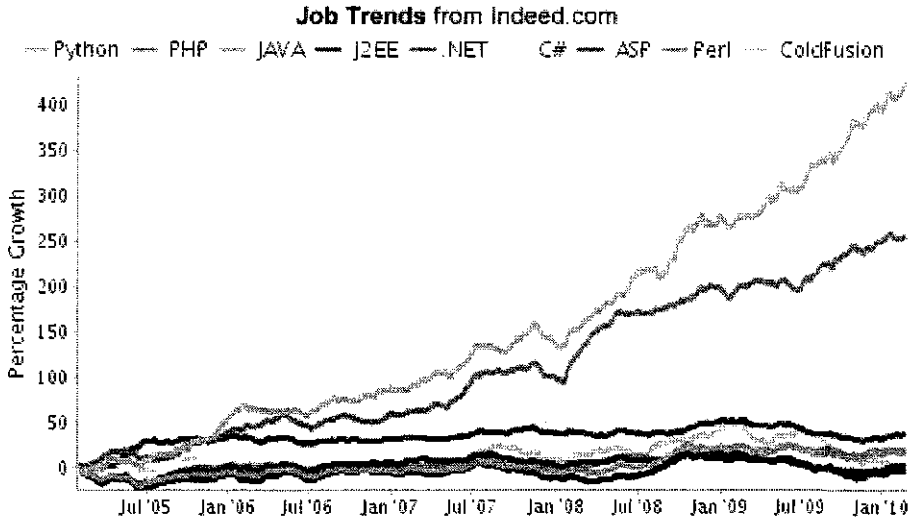
Assuming that 40% of all JAVA and .NET development is web-related, the demand levels for web-application work across all considered development technologies / platforms are actually much closer than what's presented in the graph.

Demand Trends in Relative Terms

Next, let's review the same trend as a relative percentage.



The demand for Ruby has increased 1,500% over the last 5 years. However, the absolute job opening volume for Ruby still only represents 0.3% of all job openings. The demand of Python has grown 450% in the last 5 years and currently represents 0.5% of all job openings. While the demand for PHP has grown 250% in the same period and currently represents 0.75% of all job openings. All other web application development technologies have experienced less than 100% growth over the last 5 years.



Open-Source vs. Closed-Source Predictions

While closed-sourced platforms such as .NET are making attempts to appeal to a broader spectrum of developers and are starting to provide flexibility typically only seen in the open source languages and platforms (see the "Dynamic

Programming" portion of my C# 4.0 post from last year), open source acceptance at the enterprise level is still on the rise and is unlikely to stop growing despite the efforts by Microsoft and other web application development technology providers in the closed-source space.

As per data above, the demand levels for the open source web application development technology and platforms are growing significantly faster than their closed-source counterparts. Given the current growth rates, it is likely that there will be more web application development jobs in the open source space than in the closed-source space over the next 5-10 years.

PHP Predictions

PHP's low barrier of entry and it's open source nature, increased acceptance in the enterprise space (yes, Fortune 500 companies are using PHP) and proven scalability (think Facebook / 400M users) make a strong business case for the CIOs when it comes to web application development.

The demand and amount of web application development work done in PHP is likely to eclipse the demand and the amount of web application development work done in .NET and JAVA by 2015-2020. I'm not disputing that many enterprises are going to continue to use .NET and JAVA for web development. Given their existing investments in those technologies, they'll most likely continue to use the same technology. However, many start-ups and growing SMBs as well as some large enterprises are increasingly selecting PHP over .NET and JAVA for web application development. I'm expecting this trend to continue at an accelerated rate.

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Tags: .NET, C#, J2EE, JAVA, Open Source, Perl, PHP, Python, Ruby

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One Response to "Web Application Development Technology Demand Trends & Predictions"

1. *Jack Bicer* Says:
   May 13, 2010 at 8:30 PM | Reply

   Great post. Thanks for the research. We see a big demand for .NET and some for PHP development, especially from smaller companies. C# accounts for a majority of the work done.

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